



Digital marketing of nutraceutical and pharmaceutical supplements: marketing ethics and consumer comfort

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Abstract

The article provides the primary material for scholarly discourse in digital marketing science related to online consumer behavior analysis for pharmaceutical and nutraceutical supplements during crises like the current pandemic of COVID-19. We examine the relationship between digital marketing ethics and consumer comfort, focusing on consumers' perceptions of privacy information concerns and the digital marketing ethics of nutraceutical and pharmaceutical supplements based on a survey method and the answers of a convenience sample. We gathered 370 responses from a structured questionnaire, where 274 participants stated that they purchase nutraceutical and pharmaceutical supplements online, and their answers are considered valid. We test seven research hypotheses concerning the consumers' marketing comfort, the current digital marketing ethics, communication privacy management, and consumer comfort in online commerce of pharmaceutical and nutraceutical supplements. The most critical research results are that Digital Marketing Ethics and Consumer comfort directly and positively affect a high-significance level of marketing comfort. We examine the impact of information privacy concerns regarding the gathering, unauthorized access, and secondary use on consumer comfort concerns of digital marketing practices for nutraceutical and pharmaceutical supplements, and the impact of digital marketing ethics concerns regarding digital marketers' responsibility for the first time in the body of literature on digital marketing.

Keywords Digital marketing · Nutraceutical and pharmaceutical supplements · Online customers · Marketing ethics · Consumer comfort

Introduction

Pharmaceuticals are all kinds of compounds destined to be used as medicinal drugs for medicinal purposes. On the other hand, nutraceuticals are considered foodstuffs (fortified food or dietary supplements), which provide health benefits in addition to their primary nutritional value. (Pandey et al. 2010; Daliu et al. 2019; Siddiqui and Moghadasian 2020). The nutraceutical and pharmaceutical supplements market

has been growing over the last decade and has already conquered a significant part of the Biotechnology and Pharmaceuticals business sector. Many of these products do not require a doctor's prescription, although most companies suggest a doctor's counsel before purchase (Pandey et al. 2010). That situation leads consumers to seek information and knowledge from the internet via their social media friends, search engines, and medical sites of ambiguous credibility. During their research, they divulge much of their data. The data were amassed and used without their knowledge or approval—understanding who might have access to the information and the likelihood of leaks. There will be a significant conflict between privacy and health in the twenty-first century. Additionally, people will always be enticed to give up some of their privacy for better health-care services and products (Harari 2017). Particularly during crises like the current COVID-19 pandemic phase, when fear and stress-related feelings affect consumer behavior and cause herd mentality, panic buying, and uncertainty (Loxton et al. 2020).

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A challenging bet for a company is to earn the consumers' trust, to convince them that it will use their personal information according to current legislation and concerning their privacy boundaries. That attitude will make consumers eager to disclose personal data to companies' online applications and increase their approval of personalized services. They should always be asked for their consent to disclose information and be informed of the use of "cookies" and similar features. They must be persuaded that the concession of part of their privacy will earn them excessive value in consumer comfort through personalized services (Bleier et al. 2018).

A company should also consider the differences among cultures and states and their people's various levels of sensitivity. Thus, it should adopt different ways of approaching its' targeted consumers considering their cultural and demographical characteristics. In that way, companies could enhance consumers' corporate social responsibility, producing favorable brand attitudes and increasing their purchase intention (Chu and Chen 2019).

The article examines the relationship between marketing ethics and consumer comfort, focusing on online consumers' perceptions of privacy information concerns and the digital ethics of nutraceutical and pharmaceutical supplements' marketing purposes (Susanto et al. 2021; Jacobson et al. 2020a, b). The market for nutraceuticals and supplements has increased substantially over the previous ten years. In 2019 it was estimated to be worth close to USD 353 billion. According to a Google Scholar search (November 3, 2022), more than 16,000 published papers between 2010 and 2020 related to nutraceuticals or dietary supplements. Over 10,000 published papers between 2020 and 2022 related to nutraceuticals or dietary supplements. The sales of dietary supplements and nutraceuticals increased significantly in the early months of 2020 because of the SARS-CoV-2. Social distancing to prevent SARS-CoV-2 (COVID-19) transmission aroused us to consider the new ways of purchasing goods and products via distance using online platforms and their implications.

As Jacobson et al. (2020a, b) suggest, most private companies use the information they collect from public online social media to achieve three targets. Pull customers towards their products through opinion mining. Push their products toward the customers through targeted, personalized advertising. Furthermore, social media communication and interactions create strong bonds with their customers. As this "Titanic" of digital marketing practices travels through its destination, the iceberg of digital marketing ethics emerges to stop its uncontrolled course. The question is how giant this iceberg is and what impact it will make after the collision. According to Susanto et al. (2021), the collision could have been avoided if official authorities had taken appropriate measures and with mutual understanding among all parties.

The following issue comes up in the midst of a deadly worldwide epidemic, societal alienation, the increased need for pharmaceutical and nutraceutical supplements, and the ongoing discussion about data protection that has been going on since the turn of the twenty-first century. What are Greek online consumers' perceptions of private information and digital ethics' concerns in the digital marketing of nutraceutical and pharmaceutical supplements? The available empirical evidence show (Jacobson et al. 2020a, b; Metzger 2007) consumers are sensitive concerning the disclosure of personal information as individuals and as parts of minor or more significant groups and attempt to measure their willingness to "trade" some of their privacy for increased consumer comfort and in which terms. Considering the research gaps and concerns by Di Domenico et al. (2022), we investigate the perceptions of a convenience sample of online consumers of nutraceutical and pharmaceutical supplements to investigate the direct and indirect relationships among the following key constructs: (a) Marketing Comfort, (b) Digital Marketing Ethics, (c) Consumer Comfort, and (d) Communication Privacy Management.

Theoretical background, research model, research hypotheses and literature support

Communication Privacy Management (CPM) theory is a theoretical approach developed by Professor Sandra Petronio in 2002 based on the previous work of Altman in 1975. The primary purpose of this approach is to examine the relationship between disclosing a person's or group's personal information and maintaining a certain level of privacy (Petronio et al. 2021). It is about setting rules and boundaries in communication with other people to control the flow of information and prevent any unwanted leaks.

(1) Privacy boundaries, (2) private information ownership, (3) private information management systems, and (4) the dialectical nature of private information regulation consist of the primary aspects of CPM theory (Petronio et al. 2021). According to the authors, CPM consists of three operating principles, (1) private information ownership, (2) private information control, and (3) private information turbulence. The first is Private Information Ownership. The original owner of the information claims ownership rights and appoints himself as the CEO of the information communication project. He is the one who decides to whom he will share it, offering him the rank of authorized co-owner. But as he outranks all the co-owners, he alone holds the authority to add more people to their positions.

Another operating principle is personal information control (Petronio et al. 2021). To control the flow of the information, the original owner implements a set of privacy rules. These rules are developed using either core or



catalyst criteria. These rules are set from the beginning and remain invariable. The use of core criteria is more often among members of groups with specific characteristics, such as cultural, geographical, or family members, or a working environment, such as a company or a public service. Some groups enforce strict rules and a secretive approach with cultist characteristics, while others are more open to sharing information. On the other hand, catalyst criteria are used in more flexible environments to cope with changes and unexpected events. The privacy rules are open to discussion and alteration after calculating risks versus benefits to avoid unpleasant consequences.

When the privacy rules fail to accomplish their purpose, or when all the information co-owners do not follow them, private information turbulence happens. In these dark times, crucial measures must be taken. An update of the privacy management system must occur, with new, more effective, and clear privacy rules accepted by all who share the information.

Although CPM theory was developed to offer solutions for privacy management of face-to-face interpersonal relationships, it can also be applied to online connections via social media and e-commerce (Metzger 2007). People feel the same ownership of their data when sharing information on social platforms or e-shops. They welcome any benefits that may come from their disclosure and acknowledge the risks that come along, like the leak of their private information, vulnerability to spam, or interception of sensitive data like credit card numbers and passwords. Therefore, they desire to control the flow of the data they share online and establish boundaries around them. For these reasons, they tend to trust retailers and social platforms of high reputation and with a firm brand name and be more reluctant with unknown providers. To avoid the consequences of possible turbulence, they implement strategies of withholding information or giving false information to protect their privacy (Metzger 2007).

Digital Marketing Ethics is a concept that includes the study of the implications of the internet and technology in society (Susanto et al. 2021). They consist of a group of rules, guidance, and legislation intended to prevent and control the collection and management of online personal data without the consent of their owners. Privacy violations and data manipulation by significant companies are major issues digital ethics researchers face, and the following measures have been proposed to deal with them.

- Awareness of Data Management

Every time a company collects or uses an individual's data, it should be apparent to that person that it is being collected or used. Each company's action follows international and national legislation and should ask for individual consent.

- Responsibility of IT developers

All professionals who work in developing companies' websites and digital marketing applications should inform all visitors that their data are being collected and always ask for their consent. They also have the responsibility of demonstrating these options clearly and plainly.

- Group Privacy

Preemptive and counteractive measures must be taken against arbitrary classifications by digital market practitioners and discrimination of individuals when they participate in groups. Sometimes when ordering online products of a specific nature, like medical equipment and pharmaceutical supplements, a company's algorithm will classify a person to a particular interest group, like drug addicts, mental disorder patients, etc. In addition, when a person participates in a group of specific interest on social media or another platform, he has every right to keep his involvement private and known only to the boundaries of that group.

According to Jacobson et al. (2020a, b), the application of CPM theory in digital marketing practices, combined with digital marketing ethics concerns and the urge of consumers to increase their Consumer Comfort, leads to the creation of the new construct, Marketing Comfort. Consumers are always looking for gratification when using social media and e-commercial platforms. It comes in convenience when purchasing, enjoyment, or self-presentation, and they are willing to disclose personal information, for that matter. A company that offers a high-level online shopping experience, providing beautiful aesthetics, service excellence, and customer ROI, can claim victory over that subject (Izogo and Jayawardhena 2018). After all, studies have indicated that shoppers mainly shop online to save time and increase convenience (Anesbury et al. 2015). That information is used by marketers for opinion mining, customer relations, and target advertising, raising privacy protection and ethical concerns. Marketing comfort links these notions and reflects the tenacious balance struggle among them.

Theoretical assumptions

In the theoretical approach of CPM theory, Petronio made certain assumptions based on its three main elements (Petronio et al. 2021). Privacy control, ownership, and turbulence.

- People believe they are the sole owners of their personal information and have the authority to protect or allow access to it.

- When these people provide others access to their private information, they become approved co-owners and must keep it secure by the original owner.



Privacy ownership defines the orientation where information is considered private. Co-owners have obligations defined by boundaries. Multiple co-owners and research have shown sub-groups forming among them called privacy boundary cells.

- Original owners of private information believe they have all rights to control their privacy.
- People control the flow of their private information by developing and implementing privacy rules.

The rules chosen by the original owner of the information are derived from decision criteria classified into two types: core and catalyst. Core criteria affect rules that are set from the beginning and remain invariable. Catalyst criteria concern dynamic effects that can change a situation or relationship status and bring the need for rule adjustment. Research has shown (Child et al. 2012) that the concept that governs the catalyst criteria choice and implementation calculates each situation's risk–benefit relationship.

- Successful and continued information control is achieved via coordination and negotiation of the privacy rules regarding third-party access with the authorized co-owners.
- Co-ownership leads to collective privacy boundaries created and operated by all authorized co-owners, contributing to the increase of private information in their group.
- Collective privacy boundaries decide who inside and outside the group may gain knowledge of certain information and which group members have rights of disclosure.

In core groups such as families, where things are stable, and the group members are few, it is easier to achieve coordination and understanding among them. However, some situations may be challenging, like financial situations when the family's children become adults and contribute to the family's income. In large groups, like social network groups, specific privacy rules are necessary to clarify obligations, responsibilities, and authorities on information flow among its members.

- Privacy regulation can be unpredictable and cause malfunctioning of the privacy management system, leading to total breakdowns.

Unexpected events can happen, along with misjudgments and bad decisions that can create privacy turbulence. Reconsidering the privacy rules and the collective privacy boundaries is necessary to avoid that obstacle. It also reevaluates the authorized co-owners and reshapes the group with thicker borders around private information.

In their study, Jacobson et al. (2020a, b) focus on developing the appropriate guidelines and methods to exploit social media opportunities to benefit consumers and marketers alike. The introduction of the construct of “Marketing Comfort” works as the connective link among the concepts

of consumers' privacy, Digital Marketing Ethics, and Consumer Comfort. Digital marketers use social media data mainly for opinion mining, target advertising, and customer relations development. That use of their data creates privacy concerns for the consumers, who sometimes fear collecting and interception of their private information is a variable cost to pay for any consumer comfort benefits they may receive. To examine consumers' attitudes towards using their private data from marketers, Jacobson et al. assume that the willingness of consumers to disclose their personal information on social media is interconnected with the gratification they expect to receive in return. For each purchase decision, each consumer sets several desired goals to achieve. Therefore, perceived risk is a ratio of the satisfaction he gained based on the preset goals (Pires et al. 2004). Consumers' online behavior is changing fast, including discussions and information exchange among them concerning products and services quality. Therefore, digital marketers must comprehend the developing behavior of consumers to acquire mutual benefits from extensive social media use (Heinonen 2011). This presumption gave rise to the idea that there is a conflict between customers' perceptions of social media hazards and their level of satisfaction with marketers' collection and use of their social media data. On the other hand, even when marketers use their data, there is a positive correlation between the perceived advantages of using social media.

Many social media users are willing to protect their privacy and adopt privacy-protective responses, including giving false, inaccurate, or incomplete information on their social interactions. As CPM theory suggests (Petronio 2002), each information owner sets boundaries around his “property”, which can be thick or thin. Jacobson et al. (2020a, b) assume that social media users who have raised narrow limits around their data are more eager to let marketers use them. That assumption led to the hypothesis that there is a positive relationship between consumers' self-disclosure practices on the internet with the acceptance of marketers collecting and using their available social media data.

Theoretical approach and research model

The theoretical approach of Jacobson et al. (2020a, b) is the theoretical basis of our study (see Fig. 1).

This work intends to develop and test a more comprehensive model based on the theoretical approach that describes the concepts mentioned above. We test the following seven (7) research hypotheses and present our research model in Fig. 2 to express the Marketing Comfort concerns of nutraceutical and pharmaceutical supplements consumers. We focus on online purchasing through e-commercial and social media platforms and the privacy concerns that emerge from digital marketing practices, such as opinion mining, target advertising, and customer relations development.



Fig. 1 Theoretical model: Jacobson et al. (2020a, b)

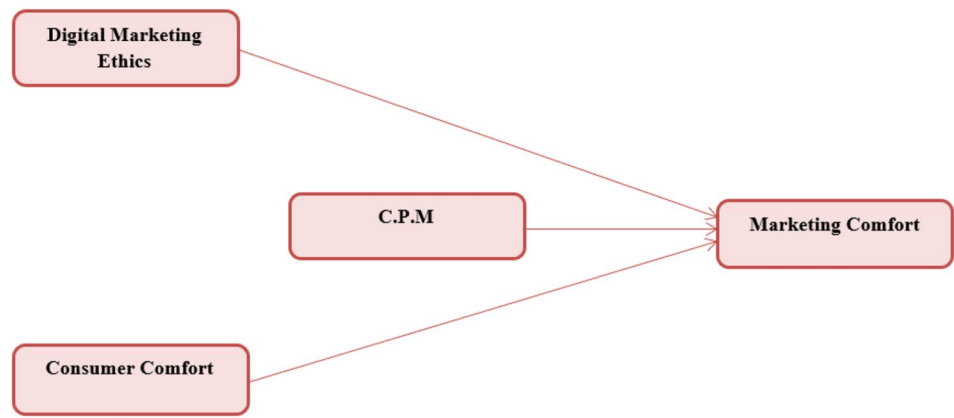
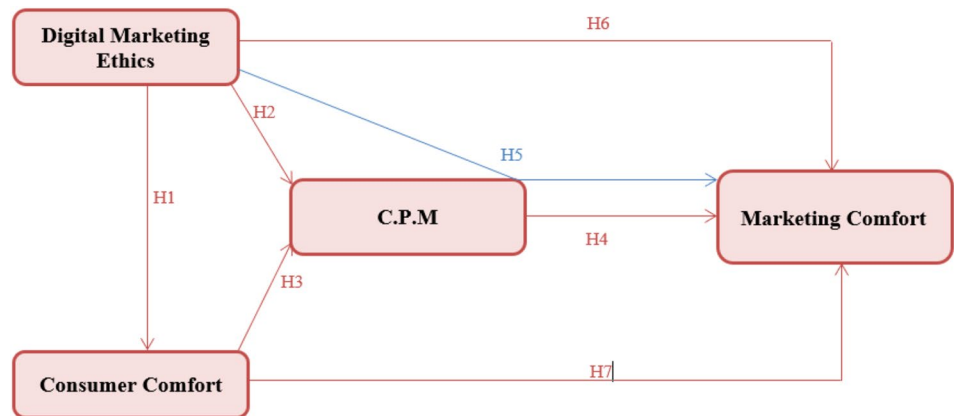


Fig. 2 Research model



The research model is used to test the following hypotheses: *H1* = Digital marketing ethics directly and positively affect consumer comfort. *H2* = Digital marketing ethics directly and positively affect communication privacy management. *H3* = Consumer comfort directly and positively affects communication privacy management. *H4* = Communication privacy management directly and positively affects consumers’ marketing comfort. *H5* = Digital marketing ethics directly and positively affects marketing comfort via the intermediate effect of communication privacy management. *H6* = Digital marketing ethics directly and positively affects marketing comfort. *H7* = Consumer comfort directly and positively affects marketing comfort.

Literature support of the research hypotheses

Digital marketing ethics upon consumer comfort

Consumers’ benefits come in the forms of convenience and better prices when purchasing, enjoyment and self-presentation when they use social media and are willing to disclose personal information to receive them (Jacobson et al. 2020a, b). A new set of ethical marketing issues emerged from the new ways of purchasing products using online and

social media platforms (e.g., Dwivedi et al. 2022). The most significant concern is the safety of the consumers’ private information and the possibility of it being manipulated and used by companies for their benefit without the consumer’s consent. As a result, consumers seem reluctant to trust online commercial platforms as they doubt the companies’ sincerity.

Communication Privacy Management (CPM) is about how establishing “privacy rules” and boundaries enables individuals to maintain ownership of and manage the flow of their personal information (Petronio 2002; Metzger 2007; Child et al. 2012; Petronio et al. 2021). Based on a series of theoretical and empirical works (Petronio 2002; Metzger 2007; Child et al. 2012; Petronio et al. 2021; Jacobson et al. 2020a, b), consumers consider their private information their possession and claim the right to manage it. The management of their private information has a dialectical nature with a perpetual struggle between the tendency to reveal personal information to gain benefits and satisfy personal needs and the urge to protect that information from unauthorized access, collection, and use by third parties. The CPM theory investigates how information that individuals see as private should be regulated. This theory explains how people typically devise rules for weighing the perceived costs and



benefits of disclosing or keeping personal information hidden (Schyff et al., 2020).

On the other hand, Jacobson et al. (2020a, b) present that consumers sometimes are willing to cast aside their information privacy concerns in favor of any gratification they may acquire from a transaction. They shop online for promised benefits, such as financial benefits, convenience, and increased consumer comfort. Therefore, to appease the consumers' fear and hesitation, a set of rules, legislations, and policies that would ensure online transactions and information exchanges' transparency and morality should be applied by companies and enforced by governments (Susanto et al. 2021).

Online users are trying to address the privacy issues these platforms claim to supply as they become more conscious of the flow of personal data (Greenwood et al. 2016). It is in line with data privacy protection for data marketing reasons. When online consumers anticipate that digital platforms will safeguard their private information from hacking or unauthorized use, they are said to have a privacy protection belief (Li et al. 2011). In any case, it is essential to set boundaries so that consumers feel comfortable with the marketing ethics marketers employ when using publicly accessible social media data. Therefore, we propose: H1 = Digital marketing ethics directly and positively affect consumer comfort.

Digital marketing ethics upon CPM

The healthy expansion of marketing and e-commerce in the online world is threatened by growing public skepticism about the collection of personal data, where managerial and legal obligations surrounding seeking informed consent and preserving privacy and personal data saddle organizations (Burkhardt et al. 2022). The behavioral theory's concept of "informed attitude" enables the permission elicitation method that puts customers' interests first and promotes moral information management and marketing techniques. Therefore, we propose: H2 = Digital marketing ethics directly and positively affect communication privacy management.

Consumer comfort upon CPM

If the CPM theory is applied, it could explain why customers feel pressured to share some of their personal information to fit in socially but keep the rest to themselves (Hu et al. 2020). We consider the most recent empirical data on (a) how consumers' ages affect their worries about digital privacy and willingness to share personal information (Lappeman et al. 2022) and (b) the driving forces behind the disclosure of personal health information (Zengaro et al. 2022). Therefore, we can propose that: H3 = Consumer comfort directly and positively influences communication privacy management.

Digital marketing ethics and communication privacy management upon marketing comfort

Consumers are willing to be subjected to opinion mining, customer relations techniques, and target advertising if they believe these will satisfy their demands for fun, self-presentation, information exchange, and relationship improvement, according to Jacobson et al. (2020a, b). They tend to calculate the risk vs. benefit ratio and are willing to trade some of their privacy for better prices and services. Thus, the more benefits are on the table for the taking, the more positive they become about disclosing part of their data.

CPM instructs consumers to create privacy rules to control their personal information (Petronio et al. 2021) and be responsible for authorizing the co-ownership of that information to others. In this way, they may get all the benefits of sharing information while maintaining a high level of data security. They become less reluctant to be subjected to target advertising, customer relations, and opinion-mining practices. Therefore, CPM practices aim to appease consumers' concerns about pursuing marketing comfort advantages. Consumers' anxiety may arise as a result of being exposed to the process of applying methods for organizing and managing their data, which could impair their desire to achieve optimum marketing comfort. The complexity and effort required to achieve a given level of data security reduces consumer convenience and significantly impacts consumer comfort. Thus, using the communication privacy management theory, the available empirical evidence addresses the relationship between marketing ethics and ethical concerns regarding customers' marketing discomfort. (e.g., Majeed et al. 2021) we propose: H6 = Digital marketing ethics directly and positively affects marketing comfort.

Based on the above, we will examine the interaction between privacy control and marketing comfort in digital marketing via the intermediate effect of communication privacy management (H5).

Consumer comfort upon marketing comfort

Marketing Comfort, a new construct created by Jacobson et al. (2020a, b), measures the willingness of online buyers to be subjected to opinion mining, customer relations practices, and target advertisement to receive benefits. Consumers are generally reluctant to deal with such practices because they fear violating their privacy and possibly manipulating their data. Increased application of digital marketing ethics practices in association with the methods of information control, organization, and protections described in CPM theory could appease their hesitations. After all, the incentive to increase consumer comfort is always strong among them. With the appropriate tools, they will be motivated to pursue high levels of Marketing Comfort. Susanto



et al. (2021) indicate that these digital marketing practices raise consumers' privacy concerns and lead to unauthorized data access, collection and secondary use, group discrimination, and sometimes “digital” harassment with an enormous projection of advertisement and e-mail spam. That attitude leads consumers to withhold or provide false information as a precaution (Metzger 2007). To gain their trust, each company should have clear and crystal policies and legislation when they ask for data that are easy to understand and make sure that they have notified their customers and asked them for their consent. Clarity and transparency of the information management procedures will turn consumers optimistic about marketing practices such as opinion mining, customer relations, and target advertising. Thus, we propose that: H7 = Consumer comfort directly and positively affects marketing comfort.

Table 1 presents the operational definitions of the key constructs and the variables, the measured items for each variable, and the variables' level of measurement.

Methodology

Research approach, research method, participants, procedure and data collection

We adopt a deductive research approach. We set as a basis the extended theoretical model of Jacobson et al. (2020a, b) based on Petronio's (1991) “Communication Privacy Management (CPM)” theory to test a specific set of hypotheses concerning the consumers' Marketing Comfort. Following the father of the survey method and questionnaires, Francis Galton (1869), we employ the quantitative research method of the survey. With the creation of a questionnaire, we collect primary data from online customers of pharmaceutical and nutraceutical supplements. We used these data to test our seven (7) research hypotheses.

This study examines the relationship between Digital Marketing Ethics and Marketing Comfort, focusing on online consumers' perception of their private information concerning their Consumer Comfort. Thus, the sample is focused on adult online consumers of pharmaceutical and nutraceutical supplements in the state of Greece during the pandemic COVID-19 period. The only restrictions were age—you had to be older than 18—and having a Gmail account, as the questionnaire was distributed using Google's infrastructure (Google Forms). Each Gmail account was only allowed to respond once to protect the questions' integrity. We gathered 370 responses in total, where 274 participants stated that they purchase nutraceutical and pharmaceutical supplements online, and their answers were considered valid. The collection of the answered questionnaires took place from November 2021 to February 2022. Based

on time and cost constraints, we adopted the convenience sampling strategy. The respondents were selected by email invitation on their email address or by public invitations on academic and research forums. We intended to reach at least 200 respondents.

Research instrument, measures and variables level of measurement

For the research needs of the study, the research instrument is a structured questionnaire written in Greek. It was distributed to online consumers of pharmaceutical and nutraceutical supplements in Greece. The questionnaire structure is based on previous studies examining the underlined key constructs and concepts such as Marketing Comfort, Consumer Comfort, and CPM in a digital marketing context (Jacobson et al. 2020a, b; Metzger 2007; Kumar et al. 2018). The questionnaire consists of four sections: A. Digital Marketing Ethics. The measures used in the questionnaire to measure digital marketing ethics are based on the studies of Susanto et al. (2021), Kurt and Hacıoglu (2010). B. Consumer Comfort. The measures used in the questionnaire to measure consumer comfort are based on the studies of Jacobson et al. (2020a, b). C. Communication Privacy Management. The measures used in the questionnaire to measure CPM management are based on the works of Petronio (e.g., Petronio et al. 2021; Child et al. 2012; Metzger 2007; Petronio 2002). D. Marketing Comfort. The measures used in the questionnaire to measure marketing comfort are based on the studies of Jacobson et al. (2020a, b); Dwivedi et al. (2019).

In the questionnaire, we use closed-ended questions. According to Galton (1869), in that type of question, respondents can answer through a limited choice of predefined answers. Types of close-ended questions include:

Dichotomous questions (nominal level of measurement)

With these questions, respondents are given a two-option response (e.g., Yes/No, Male/Female). Questions 1, 8, and 10 of Part 1 of our questionnaire are of that type.

Multiple choice questions (nominal level of measurement)

With that question, the respondent is given a choice among several predefined answers. Questions 2, 3, 4, 5, 6, 7, and 9 of Part 1 of our questionnaire are of that type.



Table 1 The operational definitions of the key constructs and the measurement items of variables

Constructs	Definitions	Variables	Measurement items	Variables level of measurement	References
Digital marketing ethics	Concerning privacy from an ethical prospect, it examines any gaps in the law and ethical standards that may have arisen in the realm of information technology due to the rapid expansion and development of IT goods and aggressive marketing strategies	Data collection Secondary use Unauthorized access	Websites seeking information online should disclose the way the data are collected, processed and used I am concerned that the companies will share my personal information with other parties I am concerned that the companies will use my personal data for purposes other than the reason I provided the information for Databases that contain personal information should be protected from unauthorized access no matter the cost I believe that companies take the necessary measures to protect their clients' personal information from unauthorized access I am concerned that companies will use my personal information to classify me into groups with certain characteristics	Ordinal	Susanto et al. (2021)
Consumer comfort	Consumers' benefits that come in the forms of convenience and better prices when purchasing, enjoyment and self-presentation when they use social media and they are willing to disclose personal information to receive them	Group discrimination Intention and awareness Rules and legislation Availability to information management Receiving information Financial benefits Convenience	When I disclose information on a website, I consciously intend to do so When I disclose information on a website, I am consciously aware of what I am revealing The existing laws in my country are sufficient to protect their citizens' online privacy Companies' websites must give the users the opportunity to change or delete any information they have disclosed at any time I shop online as I get full product details, an extensive collection of goods and offers available on websites Shopping online enables me to compare prices easily I find better offers and discounts when shopping online I prefer shopping online because of the 24/7 availability I prefer shopping online as there are more payment options	Ordinal	Jacobson et al. (2020a, b)

Table 1 (continued)

Constructs	Definitions	Variables	Measurement items	Variables level of measurement	References
Communication privacy management	It is about how establishing "privacy rules" and boundaries enables individuals to maintain ownership of and manage the flow of their personal information	Dialectical nature	<p>I am comfortable in posting private information on the internet</p> <p>I am comfortable in disclosing my email address or my cellphone number on a company's website</p> <p>I am concerned that a company will gather too much personal information about me</p> <p>I consider my private information to be my own property</p> <p>I consider I have the exclusive right to control how my private information is collected, used and shared after I disclose it on a company's website</p> <p>I am comfortable in disclosing information online concerning my cultural preferences, my income status, my family status or my health history on a company's website</p> <p>I always consider the risk versus benefit ratio when disclosing information on a company's website</p> <p>I can easily control the number of messages I receive from companies</p> <p>I feel I have complete power over the way in which my personal information will be used by companies for personalized communication</p> <p>I would consider making up fictitious responses to avoid giving real information about myself on a company's website</p> <p>I would resort to using another name or email address when registering to a company's website, to avoid revealing my real identity</p> <p>When registering to a company's website I would only fill in data partially</p> <p>When I feel my privacy has been compromised by a company, I consider to never purchase online again</p> <p>When I feel my privacy has been compromised by a company, I consider to never disclose any real personal information again</p> <p>When I feel my privacy has been compromised by a company, I consider to keep on purchasing online as before apart from the specific company's website</p>	Ordinal	Petronio, (2002), Metzger (2007) Child et al. (2012) and Petronio et al. (2021)
		Information ownership			
		Information control			
		Privacy boundaries			
		Privacy turbulence			



Table 1 (continued)

Constructs	Definitions	Variables	Measurement items	Variables level of measurement	References
Marketing comfort	It mixes modern digital marketing techniques with marketing ethics and consumer comfort. Consumers are willing to grant part of their private information and to be subjected to opinion mining and targeted advertising to increase their consumer comfort	Target advertising Customers relations Opinion mining	I would feel comfortable if information posted by me on companies' websites will be used for targeted advertising, providing me with information of new products and exclusive offers that would personally interest me I would feel comfortable if information posted by me on companies' websites will be used for customers relations, providing me with personal e-mails and communication via SMS and phone calls for an enhanced communication experience with the company I would feel comfortable if information posted by me on companies' websites will be used for opinion mining, to help the companies design new products and services and improve the existing ones	Ordinal	Jacobson et al. (2020a, b) and Dwivedi et al. (2019)

Scaled questions (ordinal level of measurement)

These questions require the respondents to choose an answer from a predefined list, ranging from a shallow rate to a very high one. The most common form of that type is the Likert-scale questions. Questions from parts 2, 3, 4, and 5 of the questionnaire (questions 11–43) use a 5—point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree.

Research results

Sample characteristics and descriptive statistics

The sample consists of 274 participants who use the Internet to purchase pharmaceutical and nutraceutical supplements. Most respondents were females (53.3%, *n* = 145), slightly more than males (46.7%, *n* = 127). Most respondents (60.1%, *n* = 164) were 35–50. The respondents from Western Greece, Peloponnese, and Northern Greece shared almost equal representation (17.2%, *n* = 47), (11.7%, *n* = 32), and (12.8%, *n* = 35). Most participants (46.3%, *n* = 126) were married with children, whereas (35.7%, *n* = 97) were single. Regarding the educational background of most of the respondents, the highest academic level was postgraduate academic studies (Master/Ph.D.), followed by graduates of universities (43.2%, *n* = 118). Most respondents (43.0%, *n* = 117) had yearly incomes of between 10,000 and 20,000 euros, whereas 29.8% (*n* = 81) of them did not. Most participants (55.7%, *n* = 152) answered the question, “how often do they buy pharmaceutical and nutraceutical supplements?” once every six months. According to 92 responses (33.7%), once per month. Last but not least, 46.7% (*n* = 128) of the subjects have created at least one account on a website, compared to 53.3% of the subjects (*n* = 146) who preferred to shop as a guest.

Reliability analysis

To check the survey's internal consistency for each construct, we conducted a reliability analysis based on the Cronbach Alpha (CA) test independently. Values that are near to 1.00 show that the parameters under investigation can be measured. According to Fraenkel and Wallen (1996), if the alpha is between 0.70 and 0.99, the trustworthiness of the items is adequate. According to Kubiszyn and Borich (2000), a number between 0.80 and 0.90 is considered appropriate. According to Mohamad et al. (2015), 0.60 is the acceptable value in the social sciences. This practice is shared by other researchers. The CA coefficient for “Digital Marketing Ethics” is 0.67, which



indicates that the internal consistency is generally excellent (according to Fisher 2007). The CA coefficient for the second scale, “Consumer Comfort,” is 0.62, indicating that internal consistency is satisfactory for that scale. For the “C.P.M.,” the coefficient is 0.74. Finally, on the last scale, “Marketing Comfort”, the CA coefficient is 0.82, indicating high internal consistency.

Interpretation of the questionnaire results

Considering the most significant answers to the questionnaire, 79.2% of participants believe that companies must provide them authority to change or delete any information they have disclosed. Most strongly demand (69%) and (23.4%) clarity and transparency from the website operators about how the data are collected, processed, and used. The majority, 27.7%, strongly agree, and 40.9% agree they have full consciousness when they disclose any information online, although 60 individuals (21.9%) doubt the fact. Also, 26.6% (strongly agree) and 37.2% (agree) claim that they are always aware of the content of the information they disclose.

A considerable amount, 62.7%, is concerned that the companies will use their data for purposes other than the reason they provided the information. Only 27% believe companies take the necessary measures to protect their client's personal information from unauthorized access. 65% do not trust that companies will not share their personal information with other parties. Finally, the vast majority of the respondents, 71.6%, expressed their concerns that companies will use their personal information to classify them with specific characteristics.

According to the answers, more than half of the participants (69.7%) strongly agree, and 27% agree that shopping online helps them to compare prices more accessible. Moreover, 60.2% strongly agreed, and 30.3% agreed that online shopping helps them find hidden opportunities. An accumulated percentage of 84.5% strongly agreed and agreed that shopping online provides them with much information concerning product availability and offers. Almost 54% strongly agreed they prefer shopping online because of the 24/7 availability. 29.2% strongly agreed, and 25.5% agreed on the convenience multiple payment methods provide.

A large proportion of the sample (62%) strongly believes that their private information is their property. Also, 58% and 25.5% of the participants strongly agree that they have the right to control how their private information is collected, used, and shared on companies' websites. A significant proportion of 32.5% and 34.7% varied from very reluctant to uneasy in sharing their private information on the internet, while 75 individuals (27.4%) had mixed feelings about it.

Most sample subjects (76.6%) feel upset or uncomfortable disclosing information online concerning their cultural preferences, income status, family status, or health history on a company's website. The majority feel they need more confidence to easily control the number of messages they receive from companies (67.9%) or have complete power over how companies will use their personal information for personalized communication (91.3%). When asked about their reaction on how they would react when they felt that a company had compromised their privacy, 47.8% answered that they would consider never disclosing any accurate personal information again. To avoid providing the correct information about themselves on a company's website, 89 respondents (32.5%) said they would think about making up fictional comments, and 30.7% said they would use a different name or email address when enrolling on a company's website.

Regarding Marketing Comfort, 38.3% of the respondents would not feel comfortable being subjected to target advertising, while 33.2% would be ok with that. Moreover, 47.4% stated they would not be interested in developing customer relations with a company, even for an enhanced communication experience. Finally, 34.3% of the participants were pessimistic about being subjected to opinion mining to help the companies design new products and services, whereas 35.4% were optimistic about such an idea.

Correlation and regression analyses

To discover the relationships between the underlined constructs, we employ correlation analysis based on Pearson's r and Spearman's rho coefficients (see Tables 2 and 3). The tables show that there is no indication of multicollinearity problems.

Research Hypothesis (H1) testing: Digital marketing ethics, directly and positively affect consumer comfort

According to Tables 4 and 5, a statistically significant positive linear correlation was found, of weak strength, between Digital Marketing Ethics and Consumer Comfort ($r = 0.156$, $p < 0.010$). The more ethical Digital Marketing becomes, the more comfortable consumers feel.

Next, linear regression analysis calculates the linear regression model to predict Consumer Comfort based on Digital Marketing Ethics. Digital Marketing Ethics was inserted at the first step of the model using the Enter method. There was no problem of multicollinearity, as both the Tolerance index ($T = 1 > 0.1$) and Variance Inflation Factor ($VIF = 1 < 10$) did not meet the phenomenon criteria. The data met the assumption of independent errors ($DW = 1.90$, Durbin–Watson statistic falls within the range of 1.5 and 2.5). Digital Marketing Ethics explained 2.4% of Consumer



Table 2 Correlations between Digital Marketing Ethics, Consumer Comfort, CPM and Marketing Comfort, using Pearson's *r* coefficient

Variable	1	2	3	4
1. Digital Marketing Ethics	–			
2. Consumer Comfort	0.156*	–		
3. Communication Privacy Management	– 0.537***	– 0.105	–	
4. Marketing Comfort	0.347***	0.157**	– 0.389***	–

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 3 Correlations between Digital Marketing Ethics, Consumer Comfort, CPM and Marketing Comfort, using Spearman's rho coefficient

Variable	1	2	3	4
1. Digital Marketing Ethics	–			
2. Consumer Comfort	0.155*	–		
3. Communication Privacy Management	– 0.503***	– 0.061	–	
4. Marketing Comfort	0.329***	0.147*	– 0.396***	–

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Comfort's variance [$R^2 = 0.024$, $F(1,272) = 1.824$, $p = 0.010$] (see Table 4).

The regression equation : $y = 3.737 + 0.174 \times x_1$
 ($y = \text{Consumer Comfort}$, $x_1 = \text{Digital Marketing Ethics}$).

In order for the predictive model to be strong, we examine the standardized. The minimum and maximum values of standardized residuals were between -3 and 3 ($\text{min} = -2.74$, $\text{max} = 1.83$). The standardized residuals' distribution histogram showed that the condition of regularity of errors was met, as the standardized residuals formed normal distribution. As a result, Digital Marketing Ethics directly and positively affect consumer comfort. Therefore, we accept the hypothesis H1.

Research Hypothesis (H2) testing: Digital marketing ethics directly and positively affect communication privacy management

According to Tables 4 and 5, a statistically significant negative linear correlation was found, of moderate strength, between Digital Marketing Ethics and Communication Privacy Management ($r = -0.537$, $p < 0.001$). The consumers' ethical concerns about Digital Marketing practices

Table 4 Linear regression results for Consumer Comfort in relation to Digital Marketing Ethics

Model	Unstandardized coefficients		Standardized coefficients		
	<i>B</i>	SE	Beta	<i>t</i>	<i>p</i> value
1. (Constant)	3.737	0.205		18.193	<0.001
Digital Marketing Ethics	0.174	0.067	0.156	2.596	0.010

a. Dependent variable: Consumer Comfort

Table 5 Linear regression results for CPM in relation to Digital Marketing Ethics

Model	Unstandardized coefficients		Standardized coefficients		
	<i>B</i>	SE	Beta	<i>t</i>	<i>p</i> value
1. (Constant)	5.140	0.162		31.817	<0.001
Digital Marketing Ethics	– 0.555	0.053	– 0.538	– 10.518	<0.001

a. Dependent variable: CPM

negatively affect their urge to disclose information, lowering the level of the CPM variable.

Moreover, we employ linear regression analysis to calculate the linear regression model to predict Communication Privacy Management based on Digital Marketing Ethics. Digital Marketing Ethics was inserted at the first step of the model using the Enter method. There was no problem of multicollinearity, as both the Tolerance index ($T = 1 > 0.1$) and Variance Inflation Factor ($VIF = 1 < 10$) did not meet the phenomenon criteria. The data met the assumption of independent errors ($DW = 1.92$). Digital Marketing Ethics was the predictor explaining 28.9% of CPM's variance [$R^2 = 0.289$, $F(1,272) = 110.629$, $p < 0.001$] (see Table 5).

The regression equation : $y = 3.737 + 0.174 \times x_1$
 ($y = \text{Communication Privacy Management}$, $x_1 = \text{Digital Marketing Ethics}$)

We also examine the standardized residuals for the predictive model to be strong. The minimum and maximum values of standardized residuals were beyond -3 and 3 ($\text{min} = -3.47$, $\text{max} = 2.59$). The standardized residuals' distribution histogram showed that the condition of the regularity of errors is met, as the standardized residuals formed normal distribution. As a result, Digital Marketing Ethics do not directly and positively affect communication privacy management. Therefore, we reject H2.



Research Hypothesis (H3) testing: Consumer comfort directly and positively affects communication privacy management.

According to Tables 2 and 3, there is not any statistically significant linear correlation between Consumer Comfort and Communication Privacy Management ($r = -0.105$, $p = 0.084 > 0.05$).

Furthermore, linear regression analysis confirmed that Consumer Comfort could not be considered as a predictor to CPM [$R^2 = 0.011$, $F(1.272) = 3.018$, $p = 0.084 > 0.05$] (see Table 8). As a result, Consumer Comfort didn't have a direct and positive effect on CPM. Therefore, we reject H3 (Table 6).

Research Hypothesis (H4) testing: Communication privacy management directly and positively affects consumers' marketing comfort.

According to Tables 2 and 3, a statistically significant negative linear correlation was found, of moderate power, between Communication Privacy Management and Marketing Comfort ($r = -0.389$, $p < 0.001$).

Consumers' concerns about CPM make them feel unease about their possibilities of Marketing Comfort. Moreover, we employ linear regression analysis to calculate the linear regression model to predict Marketing Comfort based on CPM. CPM was inserted at the first step of the model using the Enter method. There was no problem of multicollinearity, as both Tolerance index ($T = 1 > 0.1$) and Variance Inflation Factor ($VIF = 1 < 10$) didn't meet the phenomenon criteria. The data met the assumption of independent errors ($DW = 1.70$). CPM was the predictor explaining 15.1% of Marketing Comfort's variance [$R^2 = 0.151$, $F(1.272) = 48.390$, $p < 0.001$] (see Table 7).

The regression equation: $y = 5.509 - 0.783 \times x_1$ ($y =$ Marketing Comfort, $x_1 =$ CPM).

We also examine the standardized residuals for the predictive model to be strong. The standardized residuals' distribution histogram showed that the condition of regularity of errors is met, as the standardized residuals formed normal distribution. The minimum and maximum values of standardized residuals were just beyond -3 and 3 ($\min = -3.15$, $\max = 3.09$). As a result, CPM didn't directly and positively affect consumers' Marketing Comfort. Therefore, we reject H4.

Table 6 Linear regression results for CPM in relation to Consumer Comfort

Model	Unstandardized coefficients		Standardized coefficients		
	B	SE	Beta	t	p value
1. (Constant)	3.872	0.239		16.222	<0.001
Consumer comfort	-0.097	0.056	-0.105	-1.737	0.084

a. Dependent variable: CPM

Table 7 Linear regression results for Marketing Comfort in relation to CPM

Model	Unstandardized coefficients		Standardized coefficients		
	B	SE	Beta	t	p value
1. (Constant)	5.509	0.393		14.00	<0.001
CPM	-0.783	0.113	-0.389	-6.956	<0.001

a. Dependent variable: Marketing Comfort

Mediation analysis

To test hypotheses 5 and 6, the effect of an independent variable on a dependent one through a mediator variable needed to be analyzed). In order to test the significance of the mediation effect, the bootstrapping method was used (e.g., Bollen and Stine 1990).

Research Hypothesis testing (H5): Digital marketing ethics directly and positively affect marketing comfort via the intermediate effect of communication privacy management.

We employ multiple regression analyses to assess each component of the proposed mediation model. Initially, we find that Digital Marketing Ethics significantly predicts Marketing Comfort (Digital Marketing Ethics was positively related to Marketing Comfort, $b = 0.72$, $t(272) = 6.10$, $p < 0.05$ and $F(1.272) = 37.24$, $p < 0.05$, $R^2 = 12\%$).

Further, we find that Digital Marketing Ethics significantly predicts CPM (Digital Marketing Ethics was negatively related to CPM, $b = -0.55$, $t(272) = -10.52$, $p < 0.05$ and $F(1.272) = 110.63$, $p < 0.05$, $R^2 = 28.91\%$). Furthermore, the results indicated that the mediator, CPM was significantly related to Marketing Comfort ($b = -0.57$, $t(271) = -4.35$, $p < 0.05$ and $F(2.271) = 29.31$, $p < 0.05$, $R^2 = 17.78\%$).

We employ mediation analysis using the bootstrapping method with bias correcting confidence estimates (MacKinnon and Pirlott 2015; Preacher and Hayes 2008; Bollen and Stine 1990) to examine the impact of Digital Marketing Ethics on Marketing Comfort as mediated by CPM. In this



study, the 95% Confidence Interval of the indirect effect is obtained using 5000 bootstrap samples (Preacher and Hayes 2008). The results show that the indirect effect of Digital Marketing Ethics on Marketing Comfort is statistically significant (IE = 0.318, 95% CI 0.158–0.493), showing that there is a positive predictive relationship between Digital Marketing Ethics and Marketing Comfort ($b = 0.40$, $t(272) = 2.97$, $p < 0.05$, 95% CI 0.14 to 0.67) as mediated by CPM (and it is statistically significant). As a result, Digital Marketing Ethics has a direct and positive effect on Marketing Comfort via the intermediate effect of Communication Privacy Management (CPM). Therefore, we accept H5 (Fig. 3).

Research Hypothesis testing (H6): Digital marketing ethics directly and positively affect marketing comfort.

According to Tables 2 and 3, a statistically significant positive linear correlation was found, of weak power, between Digital Marketing Ethics and Marketing Comfort ($r = 0.347$, $p < 0.001$). The more ethical Digital Marketing becomes, the more at ease the customers feel about Marketing Comfort.

Furthermore, we employ linear regression analysis to calculate the linear regression model to predict Marketing Comfort based on Digital Marketing Ethics. There is no problem of multicollinearity, as both Tolerance index ($T = 1 > 0.1$) and Variance Inflation Factor ($VIF = 1 < 10$) didn't meet the phenomenon criteria. The data met the assumption of independent errors ($DW = 1.77$). Digital Marketing Ethics explained 12% of Marketing Comfort's variance [$R^2 = 0.120$, $F(1.272) = 37.243$, $p < 0.001$] (see Table 8).

The regression equation : $y = 3.737 + 0.174 \times x_1$ ($y =$ Marketing Comfort, $x_1 =$ Digital Marketing Ethics).

We also examine the standardized residuals for the predictive model to be strong. The standardized residuals' distribution histogram showed that the condition of regularity of errors is met, as the standardized residuals formed normal distribution. The minimum and maximum values of standardized residuals were just beyond -3 and 3 ($\min = -2.65$, $\max = 3.21$). As a result, Digital marketing ethics directly and positively affect marketing comfort. Therefore, we accept H6.

Research Hypothesis testing (H7): Consumer comfort directly and positively affects marketing comfort.

According to Tables 2 and 3, a statistically significant positive linear correlation was found, of weak power, between Consumer Comfort and Marketing Comfort ($r = 0.157$,

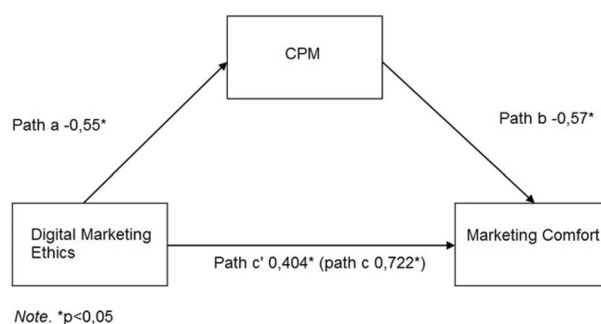


Fig. 3 The indirect effect of Digital Marketing Ethics Comfort via CPM

$p = 0.009$). The more provided conveniences to consumers, the more positively they react towards Marketing Comfort.

Furthermore, we employ linear regression analysis to calculate the linear regression model to predict Marketing Comfort based on Consumer Comfort. We insert the Consumer Comfort at the first step of the model using the Enter method. There is no problem of multicollinearity, as both the Tolerance index ($T = 1 > 0.1$) and Variance Inflation Factor ($VIF = 1 < 10$) do not meet the phenomenon criteria. The data fulfill the assumption of independent errors ($DW = 1.81$). Consumer Comfort explained 2.5% of Marketing Comfort's variance [$R^2 = 0.025$, $F(1.272) = 6.892$, $p = 0.009$] (see Table 9).

The regression equation :

$$y = 1.553 + 0.292 \times x_1 \quad (y = \text{Marketing Comfort}, \\ x_1 = \text{Consumer Court}).$$

For the predictive model to be solid, we also examine the standardized residuals. The minimum and maximum values of standardized residuals are between -3 and 3 ($\min = -2.08$, $\max = 2.42$). The standardized residuals' show that the condition of regularity of errors is met, as the standardized residuals form normal distribution. As a result, Consumer comfort directly and positively affects marketing comfort. Therefore, we accept H7.

Summary of research results

We present the research model including the research hypotheses results in Fig. 4.

In the following table, we summarize the research results for the seven research hypotheses (see Table 10).

Based on the assumptions of the adopted theories, we can interpret the above research results as follows:

1. Online consumers of pharmaceutical and nutraceutical products who disclose personal information on a com-



Table 8 Linear regression results for Marketing Comfort in relation to Digital Marketing Ethics

Model	Unstandardized coefficients		Standardized coefficients		
	B	SE	Beta	t	p value
1. (Constant)	0.614	0.362		1.695	0.091
Digital Marketing Ethics	0.722	0.118	0.347	6.103	<0.001

a. Dependent variable: Marketing Comfort

mercial website presume it as their possession. They expect the right to delete it at any time, either by choice or when they consider it vulnerable. From their point of view, digital marketing ethics dictates that companies provide them with that ability a priori and save them from the trouble of implementing privacy rules afterward.

2. When online pharmaceutical and nutraceutical products consumers disclose personal data on commercial websites, they consider the company a co-owner of that information. Implementing digital marketing ethics practices is critical for them to consider sharing part of their private information.

3. When online pharmaceutical and nutraceutical products consumers disclose personal data on a commercial website, they consider it self-evident that they can control that data and alter or delete it at will. They implement privacy rules and regulations following the company or without. That distrust is due to low digital marketing ethics and prevents consumers from achieving high consumer comfort.
4. When the original owner provides co-ownership to other parties, all parties must follow a set of privacy rules and boundaries to avoid privacy turbulence. Lack of compliance with these rules decreases the level of confidence of the online consumers of pharmaceutical and nutraceutical products in their suppliers.
5. Online consumers of pharmaceutical and nutraceutical products tend to implement privacy rules and regulations to feel safe when concerned about their information privacy. Sometimes, the complexity and dysfunction of these rules can cause anxiety in consumers, which makes the whole process tiresome.
6. Online consumers of pharmaceutical and nutraceutical products always calculate the risk versus benefit ratio when disclosing company website information. Thus, the larger the benefits they expect, the more positive they become toward opinion mining, target advertising, and customer relations.
7. Pursuing high levels of consumer comfort means implementing less strict information control measures. Online pharmaceutical and nutraceutical product consumers who fear their data being intercepted and raising thick boundaries around them are not eager to be subjected to practices like opinion mining, target advertising, and customer relations.

Table 9 Linear regression results for Marketing Comfort in relation to Consumer Comfort

Model	Unstandardized coefficients		Standardized coefficients		
	B	SE	Beta	t	p value
1. (Constant)	1.553	0.478		3.251	0.001
Consumer Comfort	0.292	0.111	0.157	2.625	0.009

a. Dependent variable: Marketing Comfort

Fig. 4 The research model including the research hypotheses results

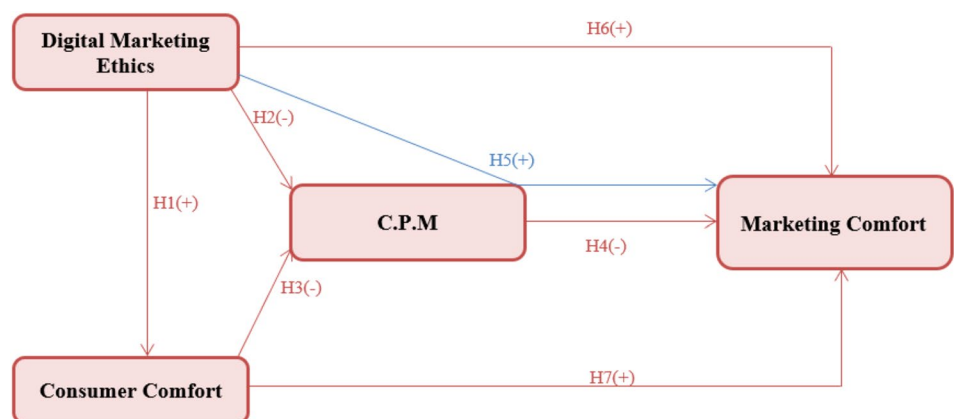


Table 10 Summary of research results

Hypothesis	Support	Significance level
<i>H1: Digital marketing ethics, directly and positively affect consumer comfort</i>	Accepted	$\alpha = 0.05$
<i>H2: Digital marketing ethics directly and positively affect communication privacy management</i>	Rejected	$\alpha = 0.05$
<i>H3: Consumer comfort directly and positively affects communication privacy management</i>	Rejected	$\alpha = 0.05$
<i>H4: Communication privacy management directly and positively affects consumers' marketing comfort</i>	Rejected	$\alpha = 0.05$
<i>H5: Digital marketing ethics directly and positively affect marketing comfort via the intermediate effect of communication privacy management</i>	Accepted	$\alpha = 0.05$
<i>H6: Digital marketing ethics directly and positively affects marketing comfort</i>	Accepted	$\alpha = 0.05$
<i>H7: Consumer comfort directly and positively affects marketing comfort</i>	Accepted	$\alpha = 0.05$

Discussion

The core of the current study was the questionnaire and the answers provided by the respondents. These results provided information about consumers' concerns regarding their privacy and safety when purchasing online pharmaceutical and nutraceutical supplements. The most significant results were that Digital Marketing ethics and the customers' Consumer Comfort affect directly and positively their Marketing Comfort. Moreover, Digital Marketing ethics now and positively affect Marketing Comfort via the intermediate effect of CPM, while Consumer Comfort fails to do that. Concerning Digital Marketing ethics, the participants expressed their worries about how the companies collect and use data. They insisted that companies must allow them to manage their personal information. They also expressed their doubts about the adequacy of the existing national laws and legislation to protect their online privacy. Consumers' desire to acquire benefits from companies by sharing part of their personal information on commercial websites contradicts the strategy of raising boundaries around it to protect it.

Considering the Marketing Comfort aspect, the questionnaire subjects demonstrated hesitation on the prospect of being subjected to customer relations, opinion mining, and target advertising. As long as it concerns their Consumer Comfort, respondents admitted that shopping online provided them with benefits such as an extensive collection of goods and offers, better prices, and 24/7 availability. On the dimension of Communication Privacy Management, they expressed their reluctance to disclose personal information online. They admitted they provided false or incomplete data on companies' websites to protect their privacy.

The dialectical nature of privacy was demonstrated in assumptions, as respondents expressed their desire to disclose personal information to gain benefits. However, at the same time, they consider that information their propriety and claim the exclusive right to manage and control it. They are also determined to raise boundaries to protect their data through information distortion or concealment. Finally, consumers seemed to calculate the risk versus benefit ratio

when disclosing information on a company's website and had mixed feelings about whether to pursue maximum Marketing comfort.

The study follows the research of Jacobson et al. (2020a, b). They looked into how consumers' perceptions of the risks and advantages of sharing their personal information online relate to how comfortable they are with marketers using that information for targeted advertising, customer service, and opinion research. By presenting a brand-new concept called "Marketing Comfort," it was represented. A construct that is closely related to the ideas of consumer comfort, communication privacy management, and ethical digital marketing. Our research on online commerce of pharmaceutical and nutraceutical supplements showed that consumers are reluctant to disclose their data to the companies' commercial sites for fear of privacy violation. However, they are indulged in doing so to improve their shopping experience. There is a direct relationship between their Comfort and Marketing Comfort and their privacy fears. While most survey respondents were uncomfortable with marketers' use of their personal information, our findings also showed that online consumers do not passively accept companies' digital marketing practices. However, actively assessing risks and benefits supports CPM theory in online data management and control, as Jacobson et al. (2020a, b) concluded.

Theoretical implications

The study allows us to see the theoretical extension and the extension of the scope of the Communication Privacy Management theory to the online retail market for pharmaceuticals and nutraceutical supplements (Petronio et al. 2021). By examining consumer privacy protection choices against digital marketing strategies and responses to unforeseen privacy turbulence from interpersonal communication and mediated communication to human-machine communication, there are fascinating expansions that may be made. The study supports the activities customers can do to safeguard their privacy and shows that ownership rules and permeability standards continue to be effective with online users



of particular privacy management marketing. An engaging dialogue between the “communication privacy management theory” and other frameworks (such as the “uses and gratifications method,” and “media equation”) may begin, especially when marketing scholars are interested in analyzing tensions (e.g., Xu et al. 2022). For example, various gratifications may evoke online consumers' privacy concerns about the specific market and social presence experiences. Under this prism, we can examine the privacy management guidelines that users of “smart” technology may implement when engaging in online interactions. It could examine how social media use and privacy worries among online users of pharmaceutical products affect how they control their privacy, significantly when social media and consumer communications change during periods of health crises. (Li and McCrary 2022).

There is a need for better awareness of the ethical standards governing online commercial transactions in the marketing literature because there is research on consumers' expectations of privacy and comfort with marketers using their private information online. According to the CPM theory, each information owner creates limits around his or her “property,” which may be substantial or minimal (Petronio 2002). According to Jacobson et al. (2020a, b), people with loose boundaries around personal information are less hesitant to allow marketers to use it. Based on that assumption, aiming for high consumer comfort levels necessitates using less stringent information control procedures. We find an exciting extension of the theory by noticing that consumers who worry about the interception of their data and who set up significant barriers around them do not want to be subjected to methods like opinion mining, target advertising, and customer relations. By classifying and illuminating the ethical concerns consumers feel are essential to consider while purchasing drugs and nutraceutical supplements online, our study aims to address that issue.

The extension of Jacobson et al. (2020a, b) and the inclusion of the “Marketing Comfort” construct allowed us to see its application from social media platforms to commercial sites and presented customers' attitudes toward marketing methods such as information exchanging, tugging, and pushing. Marketing Comfort demonstrates the CPM theory's influence by involving risks and benefits. Based on the three fundamental components of the CPM theory, Professor Petronio made some assumptions about privacy control, turmoil, and ownership in her theoretical treatment of the theory (e.g., Petronio et al. 2021). When someone posts personal information on a business website, they assume ownership. They demand the freedom to remove it at any time, voluntarily, or when they believe it to be in danger. From their perspective, digital marketing ethics requires businesses to provide that capability upfront to spare them the hassle of enforcing privacy standards afterward. Additionally, they

argue that businesses must always obtain permission before using personal information and clarify the type of information requested.

According to our study's results and findings, it is also worth strengthening the relative theoretical assumption, as consumers' minimum expectation is to protect such information from unwanted access and manipulation, regardless of the cost. Online consumers consider the business a co-owner of the information when they divulge personal information on commercial websites. They must consider revealing some of their private information before considering implementing digital marketing ethics guidelines. Additionally, consumers assume they have complete control over their personal information and can change or remove it whenever they want when they disclose it on a commercial website. They either comply with the company's privacy policies or do not. Our study shows that in some contexts, such as the one we conduct our study, using techniques such as fabricating responses to withhold accurate information partially and disclosing false data as a precaution to protect their privacy. It is another interesting theoretical extension. Low digital marketing ethics are to blame for this mistrust, which keeps customers from obtaining high comfort levels. To prevent privacy turbulence when the original owner to other parties' grants co-ownership, all parties must adhere to a set of privacy norms and limitations. Consumer confidence in the business is reduced when these principles are not followed. This mistrust prevents them from engaging in digital marketing activities like consumer relations, target advertising, and opinion mining, which fosters animosity toward their marketing comfort.

Another intriguing theoretical implication of our research is that when customers worry about the privacy of their personal information, they often enact privacy policies and regulations to feel comfortable. Consumer anxiety can occasionally be brought on by the intricacy and dysfunction of these regulations, which makes the procedure tedious. According to the study's findings, the participants' willingness to achieve more excellent Marketing Comfort is negatively impacted by this condition. When divulging information from a company website, customers always weigh the risks and benefits. Therefore, they grow more favorable toward opinion mining, target advertising, and customer relations the more benefits they anticipate. Based on our study, we validate that customers are more likely to enhance their marketing comfort when a high degree of consumer comfort is available.

Practical implications

Considering the consumers' concerns and desires derived from our research, marketers of pharmaceutical and nutraceutical companies should adjust their marketing methods



to improve the consumers' shopping experience and appease their information privacy concerns.

Transparency in information collection and further use is the key to reassuring consumers' concerns. Digital marketing practices should be updated to address all ethical issues that emerged when online disclosure of personal information broadened. Specifically, companies must use customer-oriented policies to inform the consumer clearly and simply how any personal information they share on the company's website will be collected, processed, and used. At this point, the policies are enormous piles of laws and rules that make no sense, and the process of reading them is so tiresome that most users do not try them. Companies should always ask for acknowledgment and acceptance from their customers. They should also provide them complete control over their information management and allow them to change or delete part of it whenever they choose.

Companies must avoid asking for information involving cultural preferences, income or family status, and health history, as customers may consider it a violation of their privacy boundaries. Also, when demanding any information, it should be clear from the company's side, what they ask, and describe the specific information they ask, so the consumer will always be aware of what and when it is disclosed.

We provided data describing consumers' views on their Comfort and the benefits they crave. Therefore, companies should intensify their efforts to increase their customers' consumer comfort to amplify their incentives of pursuing maximum Marketing Comfort. Marketers should allow consumers to control messages (e-mails, SMS) easily and notifications received to make them less reluctant toward target advertising. In developing customer relations with them, they should provide personal communication methods after debating with each customer about their desired conditions to make the experience less annoying and unpleasant. Concerning opinion mining practices, consumers should know what type of information the company will collect and use and with whom it may be shared to lower their concerns and earn their acceptance.

Finally, our study highlighted participants' distrust of existing laws and legislation. Governments and national associations must consider these results and update current laws and legislations with modern standards. They should also find ways to force companies to perform privacy and security control tests on their database and increase their protective measures to make their customers feel safe and secure concerning their privacy status.

Societal implications

In our study, we present that people acknowledge the benefits of Consumer Comfort on a large scale. If digital marketers satisfy their demand for improved private security, they

will keep using online commercial websites for purchases at an increasing rate. That attitude will change consumer habits as we know them now. And that trend will lead more businesses to turn to online services and create digital platforms. Traditional ways of shopping by visiting small retail shops in the neighborhood or large franchises at enormous shopping malls will belong to history.

Marketing Comfort describes the connection between consumers' benefits, digital marketing ethics, and marketing practices such as customer relations, opinion mining, and target advertising. Through our research, we present the beginning of a new era of personalized communication between the company and the customer, which promises advantages for both parties, assuming that the necessary measures to deal with ethical matters and data privacy will be taken. That new level of communication will be most helpful to people with disabilities and severe health conditions. It will allow the companies to offer specialized products and services depending on their needs.

The increased populations, living in huge cities in high density, and the complexity of modern life have introduced to our daily routine an endless pile of lists, tables, and stacks containing information about almost everything. We all inevitably have to sacrifice part of our privacy in our digital era. To maintain order in our communities but concerning personal rights and individual privacy, we must implement methods of increasing the level of private security and earning people's trust. We point out that beyond the companies' responsibilities on that matter, an appropriate update of the existing laws and legislation is crucial to counter any malicious data manipulation and exploitation attempts.

Further research and limitations

The evolution of consumer behavior has been the subject of many studies in the last decade of research since the transition from the physical markets to consumer preferences in digital markets of pharmaceutical and nutraceutical supplements. This study aimed to understand better consumers' perceptions of pharmaceutical and nutraceutical supplements under the prism of particular constructs. However, in an era of advanced forecasting, predicting, and explaining where marketers can perpetuate bias in the absence of moral or legal considerations, there is a clear research challenge to identify consumer groupings and describe their sociodemographic and behavioral tendencies (Petrescu and Krishen 2020).

Further research into digital marketing ethics and consumer comfort is needed. To uncover new consumer segments represented in digital marketing ethics, behavioral patterns, and sociodemographic characteristics, we need to



deepen our understanding of consumers' perceptions, fears, and perceived risks.

We adopted a convenience sampling strategy as the respondents should use the Internet to purchase pharmaceutical and nutraceutical supplements, and of course due to time and cost constraints. Also, we surveyed a relatively limited sample of 274 respondents. A survey with a larger sample and a different sampling strategy would test the model's validity. Although respondents from Attica, Western Greece, Peloponnese, and Northern Greece participated in the survey, almost half of the sample lived in Attica. A more extended data collection period could increase the sample's representation by including regions such as Central Greece, Crete, and the Aegean islands. Given the cultural, historical, and demographic disparities among nations, expanding the research to other countries or on an international scale could be intriguing. Further, examining how they affect consumers' marketing comfort based on larger samples to a broader range of nutraceutical and pharmaceutical products would be of high research value to strengthen the model's validity. We propose that comparative research be undertaken on various pharmaceutical and nutraceutical product families.

The study was undertaken during the Covid – 19 pandemic—crisis. For most, it was a stressful period where people spent more time confined in their residences, communicating and socializing using internet platforms (e.g., Dwivedi et al. 2020). That situation could have influenced a percentage of the participants' answers. It is worth running the survey after the Covid – 19 pandemic – period ends. Finally, the worldwide application of the fifth generation of cellular network technology (5G) will open new horizons in many future industries, from commerce to entertainment, transportation to education, and “intelligent” homes to healthcare. It would be exciting to perform similar research when that technology is used and compare the differences between the two eras.

Conclusion

The theoretical basis of this article is the extended theoretical model of Jacobson, Gruzd, and Hernandez-Garcia (2020) based on Petronio's (1991) “Communication Privacy Management (CPM)” theory, to assess whether a set of different factors can explain online consumers' comfort level. Factors such as culture, gender, motivation, and the current digital marketing ethics. The article aims to analyze the connection between consumer comfort and digital marketing ethics, with a particular emphasis on how online consumers perceive privacy information problems and the digital ethics of the marketing of nutraceutical and pharmaceutical

supplements. We examined the effects of information privacy concerns regarding the collection, unauthorized access, and secondary use on consumer comfort concerns of digital marketing practices for nutraceutical and pharmaceutical supplements for the first time in the literature, taking into account significant works on the subject. Additionally, we looked into the impact of digital marketing ethics concerns regarding personal information.

As CPM theory suggests, each information owner sets boundaries around his “property”, which can be thick or thin. Jacobson et al. (2020a, b) assume that consumers with thin boundaries around their private information are less reluctant to let marketers use it. Following that assumption, we concluded that pursuing high levels of consumer comfort means implementing less strict measures of information control. The research results showed that consumers who fear their data being intercepted and raising thick boundaries around them are not eager to be subjected to practices like opinion mining, target advertising, and customer relations. The following exciting conclusions are drawn based on the research results interpretation.

People who disclose personal information on a commercial website presume it as their possession. They expect the right to delete it at any time, either by choice or when they consider it vulnerable. From their point of view, digital marketing ethics dictates that companies provide them with that ability a priori and save them from the trouble of implementing privacy rules afterward. They also insist that companies must always ask for consent before using personal information and clarify the type of information requested. Further, when online consumers disclose personal data on commercial websites, they consider the company a co-owner of that information. Implementing digital marketing ethics practices is critical for them to consider sharing part of their private information.

Another conclusion is that when consumers disclose personal data on a commercial website, they consider it self-evident that they can control that data and alter or delete it at will. They implement privacy rules and regulations following the company or without. That distrust is due to low digital marketing ethics and prevents consumers from achieving high consumer comfort.

When the original owner provides co-ownership to other parties, all parties must follow a set of privacy rules and boundaries to avoid privacy turbulence. Lack of compliance with these rules decreases the level of confidence of consumers in the company. That distrust makes them reluctant to get involved in digital marketing practices such as opinion mining, target advertising, and customer relations, leading to hostile relations toward their Marketing comfort.

Consumers tend to implement privacy rules and regulations to feel safe when concerned about their information privacy. Sometimes, the complexity and dysfunction of these rules can cause anxiety in consumers, which makes the whole process



tiresome. In our results, we confirmed that reaching the conclusion that when a high level of Consumer Comfort is on the taking, consumers are more disposed to increase their Marketing Comfort. Consumers always calculate the risk versus benefit ratio when disclosing company website information. Thus, the larger the benefits they expect, the more positive they become toward opinion mining, target advertising, and customer relations.

Our exposition of the theoretical and practical ramifications of businesses' digital marketing strategies, with fascinating and worthwhile societal implications of our new proposed empirically tested model, is built on our interpretation of the research results.

Declarations

Conflict of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

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