



Strategic Analysis of the Turkish Over-the-Counter Drugs and Non-pharmaceutical Products Market

Türkiye Tezgah Üstü İlaç ve İlaç Dışı Ürün Pazarının Stratejik Analizi

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ABSTRACT

Objectives: The over-the-counter (OTC) drug (i.e., non-prescription drugs) market is growing significantly on a global scale. Our study reviews strategies for OTCs, together with other non-pharmaceutical products, such as herbal products, dietary supplements, and other healthcare products. The aim of this study is to analyze the expanded OTC industry to offer possible strategic solutions for existing problems.

Materials and Methods: We utilized integrated SWOT and Fuzzy Analytic Network Process analyses, together with quantitative analysis covering industry professionals' perspectives.

Results: Our findings showed that the most suitable market strategies are WO2 (i.e., to use information and digital technologies, including mobile applications and social media, to reduce marketing costs), SO2 (i.e., to promote self-medication/self-care to grow the OTC market and invest in information and communication technologies for this purpose), and ST2 (i.e., to improve health literacy and increase access to accurate and understandable information via alternative channels, such as the internet and social media). These key strategies are closely related to the utilization of digital technologies. Other strategies, such as SO1 (i.e., to encourage pharmacists to provide consulting for OTC products, which carry high profitability) and ST1 (i.e., to undertake stakeholder training programs to ensure production quality and introduce safe use to improve community health), were examined in detail, and their outcomes were interpreted in this study.

Conclusion: Given the impact of digital transformation, the same strategies can be implemented for other emerging OTC markets. This study underlines the importance of the OTC sector as one of the main drivers for improving community health and reducing health costs.

Key words: Over-the-counter drugs, non-prescription drugs, non-pharmaceutical products, SWOT analysis, Fuzzy Analytic Network Process

ÖZ

Amaç: Global olarak tezgah üstü ilaç (OTC) pazarı önemli ölçüde büyümektedir. Bu bağlamda çalışmamızda, reçetesiz ilaçların yanı sıra, bitkisel ürünler, gıda takviyeleri ve diğer sağlık ürünleri gibi ilaç dışı ürünler de stratejik olarak değerlendirilmiştir. Bu çalışmanın amacı, genişletilmiş OTC endüstrisinin mevcut problemlerine olası stratejik çözümler sunmak için analizini yapmaktır.

Gereç ve Yöntemler: Bu çalışmada entegre SWOT ve Bulanık Analitik Ağ Prosesi analizlerinin yanı sıra sektör profesyonellerinin bakış açılarını kapsayan nicel analizler yapılmıştır.

Bulgular: Çalışmadan elde ettiğimiz bulgular en uygun pazar stratejilerinin WO2 (sosyal medya ve mobil uygulamalar dahil bilişim ve dijital teknolojileri pazarlama maliyetlerini düşürmek için kullanmak), SO2 (OTC pazarının büyümesi için self-medikasyon/kişisel bakımı teşvik etmek ve bu amaçla bilgi ve iletişim teknolojilerine yatırım yapmak), ST2 (sağlık okuryazarlığını geliştirmek için internet ve sosyal medya gibi alternatif kanallar aracılığıyla doğru ve anlaşılır bilgilere erişimi artırmak) olduğunu göstermiştir. Bu kilit stratejiler dijital teknolojilerin kullanımı ile yakından ilgilidir. Ayrıca bu çalışmada SO1 (OTC ürünleri daha yüksek karlılık taşıdığı için eczacıyı danışmanlık yapmaya teşvik etmek), ST1 (üretimde kaliteyi sağlamak ve toplum sağlığını iyileştirmeye yönelik güvenli ilaç kullanımını tanıtmak için, paydaşlara eğitim programları düzenlemek) gibi diğer stratejiler ayrıntılı olarak incelenmiş ve sonuçları yorumlanmıştır.

Sonuç: Dijital dönüşümün etkisi düşünüldüğünde, aynı stratejiler gelişmekte olan diğer pazarlar için de uygulanabilir. Bu çalışma, OTC sektörünün toplum sağlığını geliştiren ve buna bağlı olarak sağlık maliyetini azaltan paydaşlardan biri olarak önemini vurgulamıştır.

Anahtar kelimeler: Tezgah üstü ilaçlar, reçetesiz ilaçlar, ilaç dışı ürünler, SWOT analizi, Bulanık Analitik Ağ Prosesi

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INTRODUCTION

Over-the-counter (OTC) drugs are sold directly to the consumer without a prescription because they are known to be safe and effective following long-term clinical use. However, similar to regular prescription drugs, OTC drugs may have adverse effects, and they can be misused and abused for their active substances.¹⁻⁴

Non-pharmaceutical products include a wide range of products, such as vitamins, herbal products, dietary supplements, biocidal products licensed by the Ministry of Health (MoH), certain medical devices in pharmaceutical form, medical infant formulas, cosmetics and dermo-cosmetics, and baby food. These products are used in self-care/self-medication and complementary therapy but have not been evaluated as prescription drugs because of their active metabolites.

Regulations applied by the MoH on non-prescription drugs are rather cumbersome. Pricing decisions for non-pharmaceutical products licensed by the Ministry of Agriculture and Forestry, for example, are simpler and easier to process than those for pharmaceutical products. This issue represents an advantage to non-pharmaceutical product manufacturers.

In Turkey, registration files must be submitted according to Common Technical Documents, similar to EU regulations. Some products are licensed by the MoH, while others are licensed by the Ministry of Agriculture and Forestry. Processes for the same task may differ in terms of duration and other registration requirements.⁵

In 2018, the Turkish pharmaceuticals market increased by 26.1% to 30.94 billion TL compared with that in 2017. The reasons behind this growth involve price escalation, sales distribution, volume, and new products. The Pharmaceutical Manufacturers Association of Turkey (IEIS) reported that non-pharmaceutical products described as medicinal products made up approximately 31.5% of the growth in 2018 and were valued at 2.4 billion TL.⁶ These medicinal products are examined in our study.

Unfortunately, the data available do not cover certain products, such as sports nutrition, homeopathic medicinal products, and some herbal products. Therefore, a major problem for all stakeholders, including manufacturing companies, is data quality. This problem contributes to the difficulty of understanding and interpreting the OTC market dynamics of Turkey.^{7,8}

The aim of the present study is to analyze Turkey's expanded OTC industry to offer possible strategic solutions for existing problems, including poor data quality and lack of regulation. Thus, the related market is evaluated, and strategies to grow this market are proposed.

MATERIALS AND METHODS

Data collection

The data collected consisted of literature and quantitative field research. Only a limited number of studies on OTC/non-pharmaceutical products/self-medication are available in Turkey

(Table 1), and none of them include a strategic market analysis via SWOT-Analytic Network Process (ANP)/Analytic Hierarchy Process (AHP). The available directly related studies only include our previous integrated SWOT and PESTEL analysis⁷ and a qualitative analysis of the Turkish OTC market.⁸ Our previous qualitative analysis was performed using in-depth semi-structured interviews of marketing professionals representing OTC and non-pharmaceutical products manufacturers, as well as OTC consultants, in Turkey.⁸

Besides the literature review (Table 1), data were collected from several reports and resources, such as the Turkish Statistical Institute, IEIS, and IMS Health.

The collected data (i.e., related literature, reports, quantitative field research) were used to prepare the SWOT matrix. All data from the literature, except field research, are shown in the SWOT matrix as L. The findings obtained from the online survey are shown as S (Table 2).

Quantitative survey data

This study received ethical approval (decision no: 2019/26-13, date: 25.02.2019) from the Biruni University Ethics Board. The quantitative assessment included an online survey. The IEIS, AIFD, TİSD, and other related institutes were informed about our study, but only the IEIS agreed to participate. Thus, this survey was pilot-tested on a group of IEIS experts before it was conducted on a group of OTC professionals. Data

Table 1. Results of the literature search⁹⁻²⁰

References	Related topic
Özcelikay et al. ⁹	OTC, pharmacists and patients' perspectives
Yüksel ¹⁰	OTC, pharmacists' perspectives
Gül et al. ¹¹	Role of pharmacists, OTC purchases
Kirgiz ¹²	Regulations, advertising, self-medication
Sencan and Uyar ¹³	Advertising, pharmacist and industry perspectives
Lionis et al. ¹⁴	OTC prescribing, rational drug use
Gülpınar and Özçelikay ⁵	Regulations, pharmacist and industry perspectives
Atikeler and Özçelikay ¹⁵	Regulations, pricing
Oztora et al. ¹⁶	Self-medication
Okyay and Erdoğan ¹⁸	Self-medication
Oral and Özçelikay ¹⁹	Policies, regulations, ethics
Memisoglu ⁸	OTC marketing
Memisoglu ⁷	OTC SWOT-PESTEL
Cavaco et al. ¹⁷	Self-medication
Gülpınar et al. ²⁰	Pharmacists' perspectives about non-pharmaceutical products

OTC: Over-the-counter

collection was conducted between March and June 2019. The main data were collected from a purposive sample, and the target audience included functional managers and senior executives of the OTC industry. The designed questionnaire, which included a SWOT segment, was sent to 55 members, most of whom are manufacturers, through the IEIS. The online questionnaire was also sent to 40 OTC professionals with similar qualifications via LinkedIn. In total, 42 participants responded to the questionnaire. Six questionnaires were excluded from the analysis because they included missing answers. Thus, a total of 36 valid questionnaires were included in the sample. This number of participants is considered acceptable because the participants were specifically selected for purposive sampling.

Statistical analysis

The results were evaluated using advanced statistical tools. The latter incorporated the use of AHP/ANP/ Fuzzy ANP (FANP) methods, which do not require a large number of samples to be statistically significant.²¹⁻²³ Because the participants of the survey were experts with deep knowledge and experience on the topic of interest, we believe that all 36 respondents are qualified and sufficient to provide the required information for the study.

SWOT-FANP

SWOT, as a decision-making tool, enables the subjective examination of companies, industries, and even countries. However, SWOT presents some disadvantages, such as a lack

of weighting factors and ambiguity. Besides SWOT, the FANP is used in this study.

The AHP, which was introduced by Saaty,²⁴ is a flexible and effective mechanism for complex decision-making that can help decision-makers set priorities and make the best decisions. The ANP, which is a generalization of AHP, enables the analysis of the interactions of decision criteria. Its basic structures are networks, which undergo interactions and feedback within and between clusters to solve sophisticated decision problems.

ANP and AHP are used for multi-criteria decision-making. However, the former is more appropriate for solving complicated problems because it allows the analyst to capture the complex structures of real interconnections and make predictions with greater accuracy. Saaty suggested the use of ANP to solve the problem of dependence among alternatives or criteria.^{25,26}

The ANP method is feasible for fuzzy decision-making problems because it has relatively fewer limitations compared with FANP. Determining the weights and effects of alternative strategic criteria quantitatively by using SWOT alone is impossible. Therefore, ANP/FANP should be combined with SWOT to improve the insufficiency of SWOT data.²⁷ Thus, FANP is the preferred research method in our study.

FANP consists of eight steps.

Step 1. Identify SWOT factors and sub-factors. Determine alternative strategies according to the SWOT sub-factors.

Step 2. Develop a matrix using all factors and sub-factors and form a fuzzy scale of 1-9 (W_i , i.e., matrix calculation).

Table 2. SWOT matrix for the Turkish OTC industry

Strengths (S)	Weaknesses (W)
S1 increasing self-medication/self-care (L)	W1 healthcare professionals' negative perception of herbal products and dietary supplements (L)
S2 aging population (L)	W2 information pollution caused by companies (S)
S3 increasing government support for minimizing reimbursement (L)	W3 lack of education of related stakeholders (S)
S4 absolute population growth and increased migration (S)	W4 lack of OTC regulations and certain classifications (L)
S5 increasing consumer awareness (S)	W5 non-regular market; difficulty obtaining clear data (L)
S6 pharmacies as distribution channels (L)	W6 rising costs (S)
S7 qualified people in the OTC industry (S)	W7 lack of direct-to-consumer advertising for non-prescription drugs (S)
S8 possible synergistic effects of non-pharmaceutical products (S)	W8 absence of pharmacist's role as a consultant (L)
S9 greater profitability compared with prescription drugs for the pharmacist (S)	W9 unwillingness of healthcare professionals to recommend and provide prescriptions (S)
Opportunities (O)	Threats (T)
O1 rapid market growth (S)	T1 economic crisis, exchange rate fluctuations (L)
O2 rapid developments in information and communication technologies (S)	T2 poor-quality production for some non-pharmaceutical products (L)
O3 R&D and innovation (S)	T3 poor health literacy (L)
O4 direct-to-consumer advertising (L)	T4 media disinformation (S)
O5 pharmacists as consultants/salespersons (L)	T5 lack of direct-to-consumer advertising for non-prescription drugs (S)
O6 company mergers and acquisitions (L)	T6 market penetration difficulties, highly competitive environments (S)

OTC: Over-the-counter, S: Survey findings, L: Literature findings

Step 3. Determine the inner dependence matrix of each SWOT factor with a fuzzy scale of 1-9 with respect to other factors by using a schematic representation of inner dependence among the SWOT factors (W_2 , i.e., matrix calculation).

Step 4. Determine the interdependent priorities of the SWOT ($W_{SWOT \text{ factors}} = W_1 \times W_2$).

Step 5. Determine the local importance degrees of the SWOT sub-factors with a fuzzy scale of 1-9 ($W_{SWOT \text{ sub-factors, local}}$).

Step 6. Determine the global importance degrees of the SWOT sub-factors (W_3 global sub-factors of SWOT = $W_{factors} \times W_{relative \text{ sub-factors of SWOT}}$).

Step 7. Determine the importance degrees of the strategic options with respect to each SWOT sub-factor with a fuzzy scale of 1-9 (W_4).

Step 8. Determine the overall priorities of the strategic options considering internal relations among SWOT factors ($W_{alternatives} = W_4 \times W_3$ global sub-factors).

Saaty²⁸ reported that the acceptable limit of the consistency ratio (CR) is 0.10 or less. Thus, the CR of the matrix was checked.²⁸ The AHP template developed by SCB Associates Ltd. was used for statistical analysis.

A schematic structure of the SWOT analysis was established. The related SWOT criteria and sub-criteria are shown in Figure 1. Strategies were prioritized on the basis of the FANP approach.

RESULTS

The demographics of the participants were summarized in Table 3. The respondents comprised 66.7% males and 33.3% females. Among the 36 respondents, 69.5% were aged 31-50 years, 22.2% were aged 51-60 years, and 8.3% were aged 26-

30 years. Experience could be divided into two major groups of 6-10 years (33.4%) and <21 years (27.8%). The majority of the participants worked in the marketing and sales department of the OTC industry (47.2%), and others worked in the regulatory affairs department (25%). The sample also included executives (16.7%) and managers from the medical department (11.1%) of

Table 3. Demographic characteristics of the participants

		Percentage %	Frequency n
Gender	Female	33.3	12
	Male	66.7	24
Age	26-30	8.3	3
	31-40	30.6	11
	41-50	38.9	14
	51-60	22.2	8
	6-10	33.4	12
Years of experience	11-15	19.4	7
	16-20	19.4	7
	21<	27.8	10
Department	Regulatory affairs/ market access	25	9
	Marketing	33.3	12
	Sales	13.9	5
	Medical	11.1	4
	Executives	16.7	6

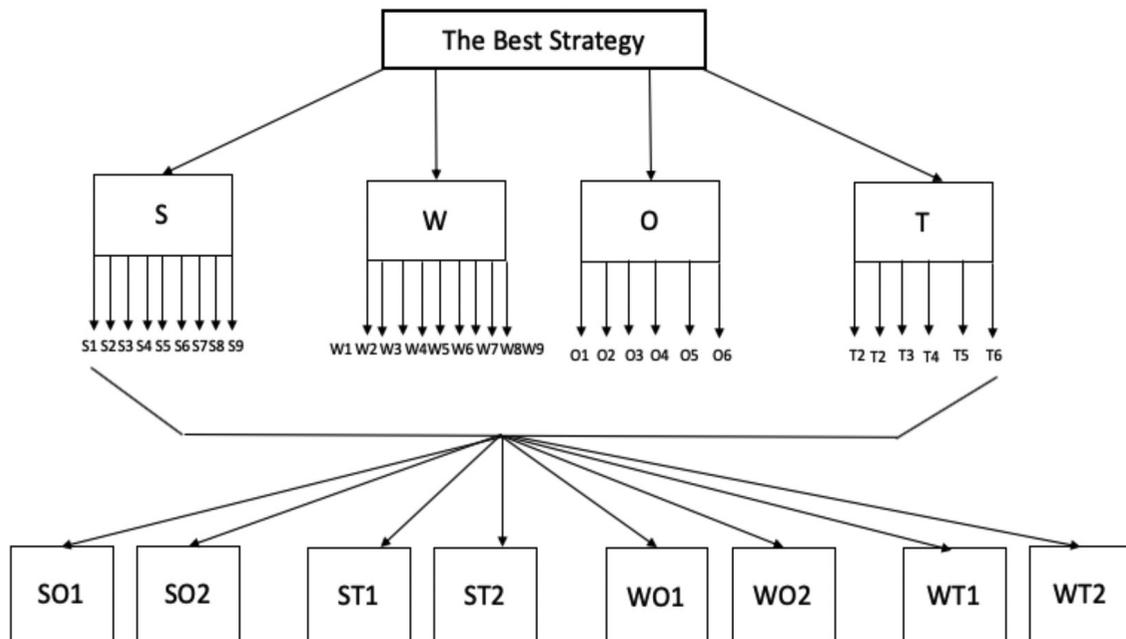


Figure 1. FANP model for the selection of the best strategies

FANP: Fuzzy Analytic Network Process

the OTC sector. All participants were functional managers or senior executives. Unlike in our previous study,⁸ both marketing professionals and managers specializing in other departments of the companies participated in our study.

Findings from the survey and other sources are consolidated in the SWOT matrix, as shown in Table 2.

Each SWOT element was checked for consistency. The CR was calculated to be less than 0.1 (10%), which is acceptable. Thus, reexamination was unnecessary because passing the consistency theory.

The fuzzy linguistic variables are shown in Table 4.

The weighting factor of FANP is essential to achieve a strategic choice. The impact of each group was analyzed on all other factors by using pairwise comparisons to obtain relative-importance weights (Table 5). Some required questions, such as "How important is strength when it is compared with a weakness?" and "How important is an opportunity when it is compared with a threat?" were used.

In this study, all possible criteria and interactions were considered (Table 6). The following table summarizes possible strategies for the Turkish OTC industry, and each strategy is individually examined (Table 7).

Table 4. Linguistic variables

	Saaty's scale	TFN	Definition of TFN		
			Bottom	Medium	Top
Equally preferred	1	1	1	1	1
Equally to moderately preferred	2	2	1	3/2	3/2
Moderately preferred	3	3	1	2	2
Moderately to strongly preferred	4	4	3	7/2	4
Strongly preferred	5	5	3	4	9/2
Strongly to very strongly preferred	6	6	3	9/2	5
Very strongly preferred	7	7	5	11/2	6
Very strongly to extremely preferred	8	8	5	6	7
Extremely preferred	9	9	5	7	9

TFN: Triangular fuzzy number

Table 5. Pairwise comparison of SWOT groups without interdependencies

	S	W	O	T	TFN importance of SWOT factors		
					Bottom	Medium	Top
Strengths (S)	1.000	3.000	2.000	2.000	0.250	0.352	0.352
Weaknesses (W)	-	1.000	0.500	0.500	0.250	0.166	0.166
Opportunities (O)	-	-	1.000	1.000	0.250	0.241	0.241
Threats (T)	-	-	-	1	0.250	0.241	0.241

TFN: Triangular fuzzy number

SO1: The profitability of OTC products will increase the consultation capacity of the pharmacist. Thus, companies may need to involve pharmacists in their marketing strategies. This strategy maybe effective if the prejudice of pharmacists against OTC drugs and non-pharmaceutical products is reduced and knowledge about these products is increased. Therefore, improving the quality of training and supporting training with digital technologies are important.

SO2: Self-medication and self-care are increasing rapidly on a global scale.²⁹ In line with these developments, the promotion of self-medication/self-care may be expected to grow the OTC market in Turkey. The expansion of health and wellness trends will also grow the market. The government should support OTC products because these products do not require reimbursement. Therefore, support for these products may be a good strategy to support self-medication. However, increasing the health literacy of the public is necessary to avoid the incidence of serious adverse reactions.

ST1: Poor-quality products of some non-pharmaceuticals present a great threat to the OTC industry. Education and training are vital in the eco-system. As one will increase the qualified personnel in the OTC industry, production quality will increase via the application of good manufacturing practice standards and inevitably lead to the safe use of these products.

ST2: Assuming that companies provide correct information, access to this information and diversification of channel sources, such as the internet, can increase health literacy. Increased use of advertising and various information technologies will also promote self-medication.

WO1: Poor-quality production can be overcome by investing in innovation. Companies should prioritize innovation and spend on R&D. As the active metabolites of non-prescription drugs are well-known, the available innovations are somehow limited. The main innovation practices of OTCs are combination products, different dosage forms, and line extension.

Differentiation from competitors is an essential factor in building a successful brand and increasing market share. According to our survey findings, innovation is best when using advanced technology and creative communication strategies (72.2%). Sector participants in our survey also emphasized efficacy, quality, and corporate reputation (42.9%) as key factors in building a strong brand.

WO2: In times of economic volatility, all pharma companies and consumers strive to survive. External factors, such as

the economic crisis and exchange rate fluctuations, could increase costs for companies. As companies cannot directly intervene in macro factors, such as economic crises, they can instead develop counter-strategies by introducing cost-saving measures. They may, for example, switch from traditional to digital media, thereby taking advantage of the benefits of social media. At this point, effective content management will gain importance for OTC companies.

WT1: Advertising restrictions may be effective in improving the negative perspectives of physicians and pharmacists.

Advertising control is important for patient safety, especially when literacy and/or educational levels vary among the public. In our study, the participants agreed that environmental, economic, and social sustainability, which also cover the safety of non-pharmaceutical products (86.1%), should be among the priorities of pharma companies (88.8%).

Direct-to-consumer advertising for prescription and non-prescription drugs is banned in Turkey³⁰ but freely available for non-pharmaceutical products. No specific regulation regarding the use of social media by companies is yet available. The

Table 6. Importance of the criteria and sub-criteria of the SWOT analysis

SWOT groups-criteria	Importance of the SWOT criteria	SWOT sub-criteria	Local importance of SWOT sub-criterion	The overall importance of SWOT sub-criterion
Strengths (S)	0.250-0.352-0.352	12S1	0.26-0.284-0.308	0.065-0.1-0.108
		S2	0.087-0.125-0.118	0.022-0.044-0.042
		S3	0.134-0.095-0.09	0.034-0.033-0.032
		S4	0.148-0.161-0.164	0.037-0.057-0.058
		S5	0.085-0.099-0.096	0.021-0.035-0.034
		S6	0.08-0.08-0.076	0.02-0.028-0.027
		S7	0.069-0.054-0.051	0.017-0.019-0.018
		S8	0.071-0.051-0.048	0.018-0.018-0.017
		S9	0.066-0.051-0.048	0.017-0.018-0.017
Weaknesses (W)	0.250-0.166-0.166	14W1	0.103-0.131-0.127	0.026-0.022-0.021
		W2	0.103-0.137-0.132	0.026-0.023-0.022
		W3	0.103-0.09-0.087	0.026-0.015-0.014
		W4	0.237-0.235-0.258	0.059-0.039-0.043
		W5	0.089-0.1-0.093	0.022-0.017-0.015
		W6	0.133-0.131-0.132	0.033-0.022-0.022
		W7	0.078-0.064-0.062	0.02-0.011-0.01
		W8	0.078-0.057-0.054	0.02-0.009-0.009
		W9	0.078-0.057-0.054	0.02-0.009-0.009
Opportunities (O)	0.250-0.241-0.241	28O1	0.281-0.416-0.44	0.07-0.1-0.106
		O2	0.18-0.205-0.202	0.045-0.049-0.049
		O3	0.159-0.149-0.144	0.04-0.036-0.035
		O4	0.14-0.094-0.088	0.035-0.023-0.021
		O5	0.114-0.065-0.059	0.029-0.016-0.014
		O6	0.127-0.071-0.066	0.032-0.017-0.016
Threats (T)	0.250-0.241-0.241	29T1	0.549-0.492-0.516	0.137-0.119-0.124
		T2	0.093-0.105-0.1	0.023-0.025-0.024
		T3	0.093-0.105-0.1	0.023-0.025-0.024
		T4	0.088-0.099-0.095	0.022-0.024-0.023
		T5	0.088-0.099-0.095	0.022-0.024-0.023
		T6	0.088-0.099-0.095	0.022-0.024-0.023

lack of direct-to-consumer advertising can be turned into an advantage for public health, especially among groups with low health literacy. This strategy may be a strong point for Turkey, where nearly half of the population has limited health literacy.³¹

Companies should prioritize the disclosure of accurate information to target consumer groups. In Turkey, new regulations, as well as a proper classification for OTCs, are necessary. OTC ads should also be organized in this context.

According to Table 8, 9, after prioritizing the defined strategies, we can conclude that WO2, which has the highest weight of 0.163, is the best market strategy. Other potential strategies include SO2 (weight, 0.161) and ST2 (weight 0.160). In terms of weight, these three strategies highly similar to each other.

DISCUSSION

The survey results revealed that the strengths of the OTC industry are multifold and highly variable. Increased consumer awareness and a tendency to self-medicate are among the more noteworthy findings. Self-medication/self-care presents a number of important advantages, such as reduced government spending.²⁹ However, this same benefit may also pose a serious threat to this market. OTC drugs have potential risks, such as misdiagnosis, drug misuse and abuse, and polypharmacy-induced drug-drug interactions, especially in elderly patients.

Pharmacovigilance, also known as drug safety, for prescription drugs has been implemented since 2005. However, this regulation has yet to be established clearly for other types

Table 7. Strategies for the Turkish OTC industry

SO strategies	WO strategies
SO1 to encourage pharmacists to provide consulting as OTC products carry higher profitability	WO1 to invest in R&D and innovation to overcome poor-quality manufacturing and increase the available variety of medical treatments
SO2 to promote self-medication/self-care to grow the OTC market and invest in information and communication technologies for this purpose	WO2 to use IT and digital technologies, including social media and mobile applications, to reduce marketing costs
ST strategies	WT strategies
ST1 to undertake stakeholder training programs to ensure production quality and introduce safe use for improved community health	WT1 to limit direct-to-consumer advertising for non-pharmaceutical products to improve negative views of physicians and pharmacists. This limitation may be transformed into an advantage for communities with low health literacy
ST2 to improve health literacy and increase access to accurate and understandable information via alternative channels, such as the internet and social media	-

OTC: Over-the-counter

Table 8. Elements of the fuzzy matrix W~ 4

B values	S1	S2	S3	S4	S5	S6	S7	S8	S9	W1	W2	W3	W4	W5	W6
SO1	0.143	0.103	0.139	0.098	0.392	0.143	0.095	0.143	0.334	0.143	0.107	0.143	0.115	0.354	0.076
SO2	0.143	0.103	0.297	0.105	0.105	0.143	0.413	0.143	0.107	0.143	0.107	0.143	0.138	0.106	0.076
WO1	0.143	0.132	0.113	0.098	0.098	0.143	0.095	0.143	0.082	0.143	0.107	0.143	0.115	0.1	0.411
WO2	0.143	0.132	0.113	0.105	0.098	0.143	0.095	0.143	0.082	0.143	0.1	0.143	0.115	0.1	0.076
ST1	0.143	0.32	0.113	0.105	0.105	0.143	0.103	0.143	0.101	0.143	0.107	0.143	0.138	0.106	0.21
ST2	0.143	0.108	0.113	0.392	0.098	0.143	0.103	0.143	0.088	0.143	0.1	0.143	0.264	0.1	0.076
WT1	0.143	0.103	0.113	0.098	0.105	0.143	0.095	0.143	0.206	0.143	0.373	0.143	0.115	0.135	0.076
B values	W7	W8	W9	O1	O2	O3	O4	O5	O6	T1	T2	T3	T4	T5	T6
SO1	0.113	0.113	0.189	0.111	0.077	0.093	0.115	0.264	0.143	0.111	0.113	0.113	0.143	0.119	0.113
SO2	0.113	0.113	0.126	0.333	0.077	0.093	0.137	0.115	0.143	0.111	0.113	0.113	0.143	0.137	0.297
WO1	0.139	0.113	0.103	0.111	0.077	0.434	0.115	0.115	0.143	0.111	0.297	0.113	0.143	0.119	0.113
WO2	0.113	0.139	0.103	0.111	0.361	0.101	0.115	0.115	0.143	0.333	0.113	0.113	0.143	0.137	0.139
ST1	0.297	0.113	0.154	0.111	0.077	0.093	0.115	0.137	0.143	0.111	0.139	0.139	0.143	0.118	0.113
ST2	0.113	0.297	0.137	0.111	0.251	0.093	0.137	0.115	0.143	0.111	0.113	0.297	0.143	0.137	0.113
WT1	0.113	0.113	0.189	0.111	0.077	0.093	0.264	0.137	0.143	0.111	0.113	0.113	0.143	0.233	0.113

Table 8. Continued

M values	S1	S2	S3	S4	S5	S6	S7	S8	S9	W1	W2	W3	W4	W5	W6
SO1	0.121	0.076	0.117	0.077	0.426	0.155	0.072	0.117	0.382	0.167	0.109	0.142	0.093	0.400	0.067
SO2	0.199	0.090	0.337	0.123	0.104	0.118	0.440	0.236	0.094	0.188	0.081	0.117	0.109	0.082	0.067
WO1	0.106	0.166	0.083	0.074	0.065	0.114	0.072	0.105	0.060	0.117	0.103	0.118	0.093	0.078	0.429
WO2	0.134	0.113	0.093	0.137	0.065	0.239	0.078	0.105	0.060	0.176	0.082	0.164	0.093	0.079	0.067
ST1	0.123	0.373	0.093	0.084	0.133	0.125	0.125	0.154	0.101	0.117	0.122	0.118	0.178	0.133	0.236
ST2	0.197	0.109	0.185	0.429	0.079	0.125	0.140	0.177	0.077	0.117	0.082	0.111	0.339	0.075	0.067
WT1	0.120	0.073	0.093	0.077	0.127	0.125	0.072	0.106	0.225	0.117	0.421	0.231	0.093	0.153	0.067
M values	W7	W8	W9	O1	O2	O3	O4	O5	O6	T1	T2	T3	T4	T5	T6
SO1	0.091	0.092	0.221	0.133	0.069	0.079	0.076	0.325	0.125	0.100	0.091	0.091	0.100	0.091	0.100
SO2	0.091	0.092	0.115	0.398	0.069	0.079	0.121	0.088	0.188	0.100	0.091	0.091	0.147	0.147	0.336
WO1	0.191	0.092	0.069	0.094	0.069	0.457	0.087	0.088	0.125	0.100	0.353	0.091	0.100	0.091	0.100
WO2	0.091	0.154	0.069	0.094	0.384	0.150	0.104	0.088	0.125	0.400	0.104	0.091	0.147	0.147	0.122
ST1	0.352	0.102	0.148	0.094	0.069	0.079	0.103	0.135	0.188	0.100	0.177	0.182	0.147	0.091	0.114
ST2	0.091	0.366	0.110	0.094	0.272	0.079	0.171	0.088	0.125	0.100	0.091	0.364	0.213	0.147	0.114
WT1	0.091	0.102	0.268	0.094	0.069	0.079	0.337	0.187	0.125	0.100	0.091	0.091	0.147	0.286	0.114
T values	S1	S2	S3	S4	S5	S6	S7	S8	S9	W1	W2	W3	W4	W5	W6
SO1	0.121	0.071	0.115	0.074	0.451	0.155	0.069	0.117	0.397	0.167	0.104	0.142	0.090	0.419	0.062
SO2	0.199	0.086	0.355	0.117	0.099	0.118	0.465	0.236	0.090	0.188	0.077	0.114	0.108	0.079	0.062
WO1	0.106	0.160	0.080	0.071	0.062	0.114	0.069	0.105	0.057	0.117	0.098	0.116	0.090	0.075	0.443
WO2	0.134	0.108	0.090	0.130	0.062	0.239	0.075	0.105	0.057	0.176	0.079	0.202	0.090	0.077	0.062
ST1	0.123	0.377	0.090	0.080	0.127	0.125	0.120	0.154	0.097	0.117	0.116	0.116	0.175	0.128	0.244
ST2	0.197	0.133	0.176	0.455	0.076	0.125	0.133	0.177	0.072	0.117	0.078	0.110	0.357	0.073	0.062
WT1	0.120	0.064	0.094	0.073	0.122	0.125	0.069	0.106	0.231	0.117	0.447	0.199	0.090	0.150	0.062
T values	W7	W8	W9	O1	O2	O3	O4	O5	O6	T1	T2	T3	T4	T5	T6
SO1	0.088	0.088	0.228	0.127	0.064	0.075	0.073	0.342	0.125	0.095	0.088	0.087	0.100	0.088	0.097
SO2	0.088	0.088	0.114	0.426	0.064	0.075	0.119	0.085	0.188	0.095	0.088	0.087	0.147	0.145	0.358
WO1	0.187	0.088	0.067	0.089	0.064	0.480	0.084	0.085	0.125	0.095	0.375	0.087	0.100	0.088	0.097
WO2	0.088	0.151	0.067	0.089	0.393	0.143	0.101	0.085	0.125	0.429	0.101	0.087	0.147	0.145	0.159
ST1	0.374	0.099	0.147	0.089	0.064	0.075	0.100	0.133	0.188	0.095	0.173	0.178	0.147	0.088	0.097
ST2	0.088	0.389	0.109	0.089	0.285	0.075	0.168	0.085	0.125	0.095	0.088	0.386	0.213	0.145	0.097
WT1	0.088	0.099	0.266	0.089	0.064	0.075	0.355	0.184	0.125	0.095	0.088	0.087	0.147	0.299	0.097

of drugs. For example, healthcare professionals can only report hepatotoxicity and nephrotoxicity to the MoH for herbal medicines. The concept of pharmacovigilance should cover all types of products in Turkey. Indeed, in our study, 86.1% of the participants agreed that the vigilance system should be extended to non-pharmaceutical products.

The environmental impacts of non-pharmaceutical products remain unknown. Although some global companies attach importance to sustainability, the government should promote

campaigns related to the ecological footprint, climate change awareness, and eco-pharmacovigilance. According to our survey, 88.8% of the participants confirmed that environmental, economic, and social sustainability should be among the priorities of companies.

In this study, we stress the significant role of pharmacists. Pharmacists are the most accessible healthcare professionals and can improve medication adherence and decrease self-medication risk and cost.^{29,32,33} Thus, pharmaceutical companies

Table 9. Priorities of the alternative strategies

Strategy	Weight	Ranking/priority
SO1	0.131	4
SO2	0.161	2
WO1	0.130	6
WO2	0.163	1
ST1	0.131	5
ST2	0.160	3
WT1	0.126	7

should liaise with pharmacists to develop marketing strategies that could result in safe and ethically correct results to build consumer awareness.

The pharmaceutical industry has high-quality production capabilities, but not all non-pharmaceutical products are manufactured with high-quality standards. Kotecki³⁴ found that medical factors, such as the active ingredients of the products, clinical studies, and information obtained from scientific references, are quite effective in supporting pharmacists' OTC product decisions. Therefore, companies should focus on manufacturing quality and evidence-based information in efforts to improve community health and develop a good impression for healthcare professionals.³⁴

Unlike in previous SWOT analyses of the OTC market, Dzeperoski et al.³⁵ underlined qualified personnel as a strength factor and market growth as an opportunity. These results are similar to our findings. An earlier study on the SWOT analyses of traditional Chinese medicine reported government policy support as an opportunity,³⁶ similar to our results.

The first three strategies highlighted in our research are related to the advantages of utilizing digital technologies. Technology is crucial for innovation and differentiation in this competitive environment.³⁷ In this context, companies should adopt the rapid development of information and communication technologies to educate all stakeholders. While the internet can be a highly effective channel with which to reach the consumer and, thus, increase their awareness, one must also be aware of the dangers of information pollution. Hence, companies should conduct full diligence to protect the public from information pollution.

Turkish legislation prohibits the sale of prescription and non-prescription drugs via the internet or any other electronic media.³⁸ Companies should utilize digital communication options by complying with relevant laws and regulations.

Study limitations

The definition of the term "OTC" is ambiguous in Turkey because of the lack of regulation of some drugs and the slow progress of the diversification of sales channels. Thus, our study refers to all products sold in pharmacies, including non-prescription drugs and non-pharmaceutical products but excluding prescription drugs, as OTC products.^{7,8}

Our study is limited by its small sample size, which prohibits quantitative analyses. The questionnaire was sent to IEIS members and some experts with similar qualifications via LinkedIn. Only 36 participants completed all of the questions.

The AHP, ANP, and FANP methods used in our study do not require a large number of samples to be statistically significant.²¹⁻²³ Additionally, the participants of the survey were experts with deep knowledge and experience on the OTC and pharmaceutical industry. All 36 responders were qualified to provide the required information for this study.

CONCLUSION

Our study is among the first detailed strategic studies to use integrated SWOT and FANP to analyze the Turkish OTC market.

We strongly believe that the transformation of the OTC industry can contribute to the health of society. Companies must allocate a budget for training as part of their marketing activities. The training program should be directed to all stakeholders, such as company professionals, physicians, pharmacists, and consumers.

Companies should also increase the production quality of non-pharmaceutical products and expand their portfolio with innovative products. In addition, they should avoid aggressive and misleading advertising to improve the health literacy of consumers.

Our main finding is that the utilization of digital technologies is within the scope of priority strategies for the OTC market. Our study has clearly shown that all of the best possible strategies (i.e., WO2, SO2, ST2) highlight the importance of investing in digital technologies. The development of social media, websites, microsites, and, in particular, the related content management, are indispensable for utilizing the most appropriate strategies. The widespread utilization of digital technologies in many areas, starting from R&D, the supply chain, and production to marketing and corporate communications, will accelerate the development of OTC companies. The effective use of digital platforms will also contribute to increasing health literacy in various communities and raise awareness of OTC consumption and self-medication among consumers.

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