

Evaluation of pharmaceutical companies' websites in technology development zones: the case of Türkiye

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Received: 3 January 2024/ Revised: 12 February 2024 / Accepted: 14 February 2024

ABSTRACT: Technology development zones are crucial for innovation-driven sectors such as the pharmaceutical industry. In addition to their innovative characteristics, companies in technology development zones have corporate identities. In this context, websites are critical tools for building relationships with the public and stakeholders and represent their corporate identities. Thus, in this study, we examined the content of pharmaceutical companies' websites in technology development zones in Türkiye. After refining the list of pharmaceutical companies in technology development zones, their websites were evaluated according to criteria based on the literature considering their corporate characteristics. Next to the literature, their region, being global/local, having products, and collaborations are considered for comparison. There were 30 pharmaceutical companies in the 81 technology development zones. The highest and lowest scores are 34 and 5, respectively. We found no statistical significance in the scores of the companies' websites considering being global/local and collaborating. On the contrary, we found a statistical difference between groups considering the products and corporate communication scores of companies that have available products. In the pharmaceutical industry, as an innovation-driven sector, it is important to take place in competitive markets not only with innovation but also with technology-based products. Here, websites can serve as a channel for communication and strengthen their brand image. In addition, to enhance the accessibility and trustworthiness of content, websites should be built in a standardized and comprehensive manner.

KEYWORDS: Corporate identity; corporate websites; pharmaceutical industry; technology development zone

1. INTRODUCTION

Technology development zones (TDZs) are unique organizations for industry and academic collaboration [1]. The best-known industry-academia cooperation example, TDZ, was Silicon Valley, which is also the first example of this cooperation. TDZs operate to develop technology based on research and development, and they are named with different terms such as technoparks, techno-centers, innovation centers, science parks etc. [2]. Shifting from product-oriented competition to innovation-oriented competition resulted in knowledge-based approaches, such as industry-academia collaboration. At this point, TDZs offer significant opportunities for both entrepreneurs and researchers in Türkiye, similar to all around the world [3].

In Türkiye, TDZs were regarded as part of a national policy in the 1980s. Research and development (R&D) has been mentioned as a goal of national development plans. To enhance innovation and R&D activities, legislation specific to the TDZ was enacted in 2001 [4]. In the Technology Development Zone Law, TDZs are defined as sites where companies intend to use high and new technology to produce/develop technology or software. At these sites, the academic, social, and economic structures are integrated, and the companies transform their inventions into commercial products/services, thereby contributing to the development of their region [5]. Regarding their definition, TDZs are important for sectors using high technology and upscaling innovations, such as the pharmaceutical industry. The pharmaceutical industry is an innovation- and technology-driven industry that invested the largest amount of R&D projects in 2021 [6].

Apart from the innovative identities of pharmaceutical companies in TDZs, they also have corporate identities. Websites play a crucial role in representing corporate identity [7-12]. Besides the design and content of websites, it is critical to build relationships with the public and engage with stakeholders.

Moreover, as a communication tool, websites can improve marketing communication, manage reputation, and gain advantages in a competitive environment [13]. Furthermore, it is important for

How to cite this article: Yumrukaya L, Yavuz F, Sözen-Şahne B, Yeğenoğlu S. Evaluation of pharmaceutical companies' websites in technology development zones: the case of Türkiye. J Res Pharm. 2024; 28(6): 1946-1952.

pharmaceutical companies to regulate the content of their websites within the scope of the transparency and accuracy principles [14]. Perry and Bodkin showed that companies use websites for marketing communication and public relations [15]. Apart from marketing, corporate websites are also a tool for public relations. Hong and Rim demonstrated that corporate websites enhance customer trust [16].

Among the various sectors, pharmaceutical companies are considered to be different because their activities have a direct impact on health [17]. Hence, having adequate and appropriate information on their websites about their products will have an impact on the public's trust. Thus, in this study, we aimed to determine the current status of pharmaceutical companies' websites in these TDZs in Türkiye based on the existing literature. The evaluation was conducted according to the specific characteristics of the companies, such as being global/local, collaborating, and having products. Being global or local is considered a key factor, because corporate websites serve as communication hubs. Diverse audiences are a factor in website content [18]. Websites are also key communication tools for companies with their stakeholders [19]. Thus, having a product is another critical attribute that considers the importance of communication. Accordingly, we formed the following four hypotheses:

H1: Global companies' websites have higher scores than local companies.

H2: Companies those have collaborated with different companies/institutions have higher scores than non-collaborative companies' websites.

H3: Companies those have products have higher scores than companies that have no available products.

H4: Companies those have products have higher corporate communication scores than companies that have no available products.

2. RESULTS

The total number of TDZs' was 81. As the data collection process was completed, 2 newly established TDZs were not included. After screening the websites of the 81 TDZs, we refined 30 (%37,04) pharmaceutical companies from different regions of Türkiye. The two major cities have more than half of the total companies: 10 are in Ankara, and 10 are in Istanbul. The numbers of local and global companies were found equal.

We found that all companies have logos, e-mail, information on institutions, and corporate communication information on their websites. However, only 6,67% of companies' websites have design-related properties, such as information on logos, corporate color, brand character, and slogans. In the corporate communication category, 60% of the websites have options in different languages. In addition, 73,33% of the companies have placed social media accounts on their websites. However, none of the websites included intranets on their websites. Apart from e-mail and information on institutions, 80% of the companies' websites included marketing content and 76,67% included advertorials. Considering corporate culture, 66,67% of companies have placed their mission and vision on their websites. However, ethical standards have been found in only 23,33% of company websites. In the corporate structure category, we found information on each criterion on only a limited number of companies' websites.

After the final list of pharmaceutical companies was formed, the websites of each company were assessed according to the criteria. The criteria and scores are listed in Table 1. The highest score was 34 and the lowest score was 5. The mean scores were 14,67.

The comparisons of websites' scores between global/local companies, having/not having collaborations and having/not having products are presented in Table 2.

As seen in Table 2, after conducting t-tests, there was no significant difference found between being global/local and collaborating ($p > 0.5$). Thus, Hypotheses H1 and H2 were rejected.

On the contrary, there is a statistical difference between groups considering the products and corporate communication scores of companies that have available products ($p < .05$). Therefore, Hypotheses H3 and H4 were accepted.

Table 1. List of criteria and scores

Criteria	Available		Not available	
	n	%	n	%
<i>Design-related Properties</i>				
Logo	30	100	0	0
Information on logo	2	6,67	28	93,33
Corporate colour	2	6,67	28	93,33
Brand character	2	6,67	28	93,33
Slogan	3	10	27	90
Architectural design	0	0	30	100
<i>Corporate Communication</i>				
Website in different language	18	60	12	30
Having intranet	0	0	30	100
Social responsibility campaign	7	23,33	23	76,67
Sponsorship	6	20	24	80
Marketing content	24	80	6	20
Advertorials	23	76,67	7	23,33
Corporate promotion content	7	23,33	23	76,67
Press bulletin	8	26,67	22	73,33
Media archive	8	26,67	22	73,33
Corporate publications	5	16,67	25	83,33
Announcements	5	16,67	25	83,33
News/ Activities	7	23,33	23	76,67
e-mail	30	100	0	0
Corporate communication information	30	100	0	0
Social media account	22	73,33	8	26,67
Online communication form	14	46,67	16	53,33
<i>Corporate Culture</i>				
Information on instution	30	100	0	0
Fundamental values/policies	11	36,67	19	63,33
Ethical standards	7	23,33	23	76,67
Vision	20	66,67	10	33,33
Mission	20	66,67	10	33,33
<i>Corporate Behaviour</i>				
Economical briefing	4	13,33	26	86,67
Societal briefing	4	13,33	26	86,67
Political and legal briefing	0	0	30	100
Information on quality	16	53,33	14	46,67
Human resources briefing	5	16,67	25	83,33
<i>Corporate Structure</i>				
Message from the CEO	8	26,67	22	73,33
Organization chart	6	20	24	80
Top management team	13	43,33	17	56,67
Service/product nature	5	16,67	25	83,33
Agency/vendor network	1	3,33	29	96,67

Table 2. The comparisons of websites' scores between global/local companies, having/not having collaborations and having/not having products

Criteria	n	Mean	Standard Deviation	p
Being global/local				
Global	15	18,27	9,043	p > .05
Local	15	11,07	3,173	
Having collaborations				
Available	13	18,38	3,557	p > .05
Not available	17	11,82	9,811	
Having products				
Available	6	26,67	8,430	p < .05
Not available	24	11,67	3,226	
Corporate communication scores				
Have products	6	6,00	2,303	p < .05
No products	24	11,67	4,082	

3. DISCUSSION

Since its initial development, the Internet has been considered as an information source, and organizations are mostly related to corporate communication [20]. In line with historical definitions, the Internet also provides a powerful tool to represent corporate identities [7]. With its unique features, the Internet has led to alterations in the business and communication between companies and their customers and stakeholders [13]. Thus, the content of companies' websites has gained importance, and studies have examined the content of websites from various sectors [15,21-23].

Besides being an innovation-driven industry, multinational global firms are dominant in the pharmaceutical industry [24]. Hence, websites are crucial to fulfil communication needs because being multinational and global elevates communication necessity. As shown in Table 2, the number of local and global pharmaceutical companies in TDZs is equal, and most companies collaborate with different stakeholders. However, there were no significant differences between the two groups' websites.

One of the specific signs of a corporate company, their logo, emphasises the visualized identity. [25] Here, all companies' logos took place on their websites. The communication assets of corporate websites were examined from different perspectives, such as social responsibility and corporate reliability [16,26,27]. In our study, all companies' websites had information on corporate communication and e-mail addresses. In addition, most of the companies' websites had an option for different language and social media accounts of companies that have been placed on the websites. Apart from their communication assets, these websites also support and promote organizational activities through financial and cultural goals [28]. Various studies have emphasized that the content of a website differs according to the companies' goals [22,23,27]. We found that most companies have a mission and vision on their websites as a part of their corporate culture. Moreover, the content of the website represents the defined functions of companies in TDZs regarding their legal definitions. [29] However, political and legal briefings have not been placed on companies' websites. Furthermore, regulative measures for the websites of companies in TDZs will enhance corporate communication, accessibility, and transparency. It is also known that the social responsibility campaign, an issue that is becoming increasingly important for companies, is shared with stakeholders through websites by massive companies, especially after the COVID-19 pandemic [30]. However, in our study, only seven of the companies included information about their social responsibility campaigns on their websites.

As emphasized in the TDZs definition, companies in TDZs are also considered a commercialization hub for innovative products or services [3,5]. As shown in Table 2, only six of those 30 companies have commercial products. Having products was found to be significant for website scores according to the criteria. Having products also affects the corporate communication scores of websites. The website scores of companies that have available products were found to be statistically significant for companies that have no available products. As part of corporate communication, 76.67% of websites had advertorial content. A study conducted in 2011 on the websites of pharmaceutical companies in Turkey found that only 12.5% of national companies and 4.5% of global companies had advertorial content [31].

In today's world, companies are obliged to represent their identities not only in the real world but also in the digital world. Websites provide opportunities for bidirectional interactions between companies and the public. Thus, corporate websites are considered powerful tools to present their products, success, and

identities transparently [21]. As a competitive and innovation-driven industry, it is necessary to catch up with age and take place in a competitive market [6]. Pharmaceutical companies in TDZs have defined advanced technology, innovation, and product commercialization as companies from other sectors. Even though the specific law describes the characteristics of the companies in TDZs, there is no regulation on these companies' websites. Specifically, having a direct effect on health, the standardization of pharmaceutical company websites will be beneficial for patients and the public, considering trust and transparency.

4. CONCLUSION

In this study, we examined the websites of pharmaceutical companies operating TDZs in Türkiye. We found that having products has a significant effect on websites' scores and corporate communication aspects of the websites. As technology-driven industries, pharmaceutical companies are obliged to keep up with the digital era regarding the competitive environment and its particular status. Even though websites are considered communication and public relations tools from a general perspective, their content remains debatable. Regulatory measures to standardize the content of pharmaceutical websites in TDZs will be useful and valuable to patients. Notably, these measures also enhance patient trust and accessibility to information about companies' products.

5. MATERIALS AND METHODS

The list of TDZs was obtained from the official website of the Ministry of Industry and Technology between March 27 and 26 March 2023 [29]. We refined the pharmaceutical companies after reaching TDZ websites. The business area was determined according to the legal business title, including medical, health system, and pharmaceutical, for the first screening. After the first screening, we included companies that have the "pharmaceutical" in their legal title.

The evaluation process was conducted according to previously reported criteria [9,21,33]. The existence of each criterion scored 1 point, while the lack of features in the criterion scored 0. The maximum possible score was 40. In addition to the literature, their region, being global/local, having products, and collaborations are included to compare the companies. Adverse reaction referrals, products, information on the product, and separate pages for healthcare professionals are also included as criteria based on the business area of the companies.

Statistical analyses were performed using IBM SPSS version 23 (SPSS, Inc. Chicago, IL, USA). Firstly, the descriptive statistics were conducted. Subsequently, a normality test was performed. Subsequently, to compare the means, an independent samples t-test was used to analyze the data. The level of significance was set at $p < .05$.

Before comparisons, a test of normality was conducted by computing the Skewness and Kurtosis values. The values were found to be between +2 and -2; therefore, the data were distributed normally [34]. Afterwards, the hypotheses were tested using the independent samples t-test.

Acknowledgements: None.

Author contributions: Concept - L.Y., F.Y., B.S.Ş., S.Y.; Design - L.Y., F.Y., B.S.Ş., S.Y.; Supervision - B.S.Ş., S.Y.; Resources - L.Y., F.Y., B.S.Ş.; Materials - L.Y., F.Y., B.S.Ş.; Data Collection and/or Processing L.Y., F.Y., B.S.Ş.; Analysis and/or Interpretation - L.Y.; Literature Search - L.Y., B.S.Ş.; Writing - L.Y.; Critical Reviews - B.S.Ş., S.Y.

Conflict of interest statement: The authors declared no conflict of interest.

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