

ORIGINAL ARTICLE/ORIJİNAL MAKALE


Vaccine criticism on Turkish websites between 2017-2018: A descriptive analysis

2017-2018 arasında Türkçe internet sitelerinde aşı eleştirisi: Tanımlayıcı bir analiz

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Received: 22.05.2022, Accepted: 10.02.2023

Abstract

Objective: This study aimed to quantify the content and design attributes of Turkish vaccine critical websites and list the arguments used between 2017 and 2018 when reportedly 23000 families refused childhood vaccines.

Methods: Websites were screened by two researchers using Google, between October 30-November 23, 2017. Every researcher screened 30 results for every word query. Exclusion criteria were implemented based on Wolfe's (2002) and Kata's (2010) research. A third researcher acted as a referee and produced a final list on February 04, 2018. The websites were analyzed between April 2-August 28, 2018 according to the criteria developed in Kata's study. The criteria contained 50 items under content and design headings.

Results: Most of the resultant 16 websites were not vaccine specific and transmitted already available information. The criteria searched were generally less frequent in Turkish websites than in English and French websites. Criticism of biomedicine, superiority of alternative medicine, sharing of personal stories and use of imagery had low presence. Commercialization was observed less and religious reasons were observed higher in Turkish websites. Websites that supported religious tenets were usually about halal food and used American anti-vaccine websites as resources.

Conclusion: Turkish vaccine critical websites referring to foreign resources were usually less developed than their foreign counterparts. Network analysis of vaccine critical websites would yield more in-depth knowledge of the relationship between them. Ministry of Health should invest more in the Web, specifically targeting its response according to the criteria available in vaccine critical websites.

Keywords: Vaccination Refusal, Vaccine Hesitancy, Internet, Content Analysis

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Cite This Article: Abbasoğlu A, Gülle BT, Üçüncü İ, Ören MM. Vaccine criticism on Turkish websites between 2017-2018: A descriptive analysis. Turk J Public Health 2023;21(1):87-102.

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Turkish Journal of Public Health published by Cetus Publishing.



Turk J Public Health 2022 Open Access <http://dergipark.org.tr/tjph/>.

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Öz

Amaç: Bu çalışma 2017 ve 2018 yılları arasında, Türkçe aşı eleştirel internet sitelerinin içerik ve tasarım özelliklerini nicel olarak belirlemek ve kullanılan argümanları listelemek amacıyla yapılmıştır. 2017’de 23000 aile çocukluk aşılarını reddetmiştir.

Yöntem: İki araştırmacı Google’ı kullanarak 30 Ekim ve 23 Kasım 2017 arasında internet sitelerini taramıştır. Her araştırmacı her araştırılan kelime için 30 internet sayfasını taramıştır. Dışlama kriterleri Wolfe’un 2002’deki ve Kata’nın 2010’daki araştırmasından uyarlanmıştır. Üçüncü bir araştırmacı hakem olarak rol almış olup, son listeyi 04 Şubat 2018 tarihinde hazırlamıştır. İnternet siteleri Kata’nın çalışmasında geliştirilmiş kriterlere göre 02 Nisan ve 28 Ağustos 2018 tarihleri arasında analiz edilmiştir. Kriterler içerik ve tasarım başlıkları altında 50 madde içermektedir.

Bulgular: Elde edilen 16 internet sitesinin çoğu aşılarla spesifik olmayan ve zaten var olan bilgileri ileten sitelerdi. Araştırılan kriterler genelde Türkçe internet sitelerinde, İngilizce ve Fransızca internet sitelerine göre daha azdı. Biyotibbin eleştirisi, alternatif tıbbın üstünlüğü, kişisel hikayelerin paylaşımı ve görselliğin kullanımı az gözlemlenmiştir. Ticarileşme ile ilgili kriter daha az gözlenirken, dini sebepler Türkçe internet sitelerde daha sık gözlemlenmiştir. Dini sebepleri destekleyen internet siteleri genellikle helal gıda üzerine olup, Amerikan aşı karşıtı internet sitelerini kaynak almışlardır.

Sonuç: Türkçe aşı eleştirel internet siteleri dış kaynakları referans almaktadır ve yabancı muadillerinden daha az gelişmiştir. Aşı eleştirel internet sitelerinin ağ analizi, birbirleri arasındaki ilişkiler hakkında daha derin bilgi sağlayacaktır. Sağlık Bakanlığı internete daha fazla yatırım yapmalı, yanıtını aşı eleştirisinde bulunan internet sitelerindeki mevcut kriterlere göre düzenlemelidir.

Anahtar Kelimeler: Aşı Reddi, Aşı Kararsızlığı, İnternet, İçerik Analizi

INTRODUCTION

Although declared one of the most successful health interventions known by the WHO, during the time span the research conducted the Health Ministry of Turkey stated that 23000 families refused childhood vaccines in 2017.^{1,2,3} As of November 2022, there hasn’t been an update to this figure by the official authorities on the Internet.

Nearly 70% of the Internet users obtained information about health on the Internet in 2016.⁴ A 2018 study conducted on a cohort of approximately 1700 mothers found out that “mothers seek information about vaccination from friends or online”.⁵ The search for information increased with the level

of doubt.⁵ It’s often argued that online misinformation contributes to vaccine hesitancy.^{6,7}

Content analysis of vaccine critical internet sites has been improving since the beginning of 2000s. Essentially two trends could be observed in the methods of studies done regarding data extraction from the Internet. One branch of studies followed the development of an exclusion list to select vaccine critical websites that fulfilled a series of conditions with a detailed check list to quantify content and design criteria.⁸⁻¹¹ The exclusion list was implemented starting in Wolfe’s study, followed and expanded by similar studies.^{8-10,12} English and

French websites were studied, but to our knowledge no studies were conducted on Turkish websites with similar methods. The milestone studies were done by Anna Kata in 2010, and Bean in 2011 on English websites.^{9,10} Ward et al also used an exclusion criteria based on Kata's study to screen and evaluate French websites a few years later.¹¹

Another branch of studies used limited exclusion criteria to identify websites but tried to cover almost all vaccine critical available content leading to the use of fewer and more general criteria to quantify.^{13,14} For instance a quantitative analysis of Italian websites and a research on French websites were conducted with those methods.^{13,14} Also, a recent similar study that compared Turkish websites before and after the COVID-19 pandemic used 28 criteria to assess a general pool of available internet content such as news websites, forums and etc.¹⁵ The study lacked the checking of presence of specific content criteria such as; (1) vaccines were causing idiopathic illnesses, (2) contain poisons, (3) criteria regarding conspiracy theories and religion. Therefore the main aim of the study of Kaya et al was to compare the effect of COVID-19 rather than to reflect the content of vaccine critical websites.¹⁵

It was presumed that this study would yield different results concerning the vaccine criticism culture on the Internet of a developing and a predominantly Muslim country, Turkey. The aim of this study was to determine the frequency of content and design criteria in Turkish vaccine critical websites using generally accepted exclusion criteria and to document qualitatively the arguments used therein.

METHODS

Making the List of Vaccine Critical Internet Websites

The study was designed as a descriptive analysis of the content of Turkish vaccine critical websites by using quantitative methods and qualitative data were added to illustrate the arguments used. Two researchers (Researcher 1 and 2) used two different computers between October 30, 2017- November 23, 2017 to query the selected keywords on the Internet and prepared two separate Internet page lists of vaccine critical websites. A third researcher (Researcher 3) acted as a referee to produce a final list on February 04, 2018.

The internet sites were screened using Google, since it had 96.4% of the search engine market share in Turkey in 2018.⁹ While doing research on Google, any Google account logged in on the computers are logged out. The words that had been searched for are "aşı", "aşılama", "bağışıklama", "aşı karşıtı", "aşı reddi", "aşı caiz", "aşı otizm" which mean respectively "vaccine", "vaccination", "immunization", "anti vaccinationist", "vaccine refusal", "vaccine permissible in Islamic law", "vaccine autism" in English. The words "aşı caiz" was chosen to reflect the discussion in the public about whether the vaccines were permissible by Islamic law.

Eysenbach and Köhler relied on the results of a former research which found that 97.2% of the links clicked in a research about online health information on the web, appeared in the first 10 pages.¹⁷ Therefore, to be more exhaustive first 30 results were screened for every word that has been searched. The list was prepared according to the exclusion

criteria derived from Kata's study who based it on the study of Wolfe et al.^{8,9} The criteria had also been used and expanded in similar studies.^{10,11} Kata's exclusion list was adopted and changed the "non-English sites" criterion to "non-Turkish sites" to adapt it to Turkish and hence the exclusion criteria: (1) Listserv or newsgroup pages; (2) pages solely containing brief notices about other website content; (3) news results, medical journals or library sites; (4) video results; (5) book previews; (6) non-Turkish sites; (7) sites exclusively about adult immunization; (8) sites exclusively about veterinary vaccination and (9) inactive links.⁹

A website was defined as a "group of World Wide Web pages".¹⁸ The criteria to classify a website as anti-vaccination was also taken from Kata's study stated as "if they opposed childhood vaccination for any reason".⁹ The criteria were coded present or absent for each site.

The vaccine critical website lists that two separate researchers (Researcher 1 and 2) made were acquired between October 30, 2017 and November 23, 2017. While the researcher 1 and 2 agreed on 16, they disagreed on two web pages. These two lists were re-evaluated by Researcher 3 who decided whether a web site listed by the first two researchers was relevant.

Researcher 3 kept the identical results of queries by both of the researchers (1 and 2) even though some of them never appeared on her own result list.

The query about "vaccine" by Researcher 1 and 2 yielded two different web pages for the website "Gıda Hareketi". When the third researcher queried the key word "vaccine" neither of the web pages listed by the first two

researchers was found. Therefore the website "Gıda Hareketi" was dropped from the list of the query "vaccine" but still stayed in the resultant list because the query "vaccine autism" yielded the mentioned website.

The query by the first two researchers about "vaccine autism" yielded two different web pages for the website "Lilliputian". Researcher 3's query about "vaccine autism" did not result in either of the web pages and led to the dropping of the website "Lilliputian" from the final list.

The list including 16 websites was finalized on February 4, 2018.

The Evaluation of Criteria

The web page of the website that was accessed through the resultant links of the queries, which vary in length were chosen for analyses because of convenience. The websites were evaluated between April 2, 2018 and August 28, 2018 by using the list of criteria under "Contents" and "Design" headings used in Kata's study.⁹ Criteria include 50 items which were coded as present or absent, under two main headings.⁹ The subheadings include safety and effectiveness, alternative medicine, civil liberties, conspiracy theories / search for truth, morality, religion, and ideology, misinformation and falsehoods, emotive appeals and content aspects.

At first, two researchers independently evaluated the selected websites based on these criteria. Later, a third researcher made the final decision on the presence of a certain criteria. The results were compared with the previous studies and qualitative data were added to illustrate the criteria present.

Ethical approval was unnecessary for using

publicly open information.

RESULTS

The words “vaccine”, “vaccination”, and “immunization” did not yield any websites. The search for terms “anti-vaccine”, “vaccine refusal”, “vaccine permissible in Islamic Law”, “vaccine autism” yielded, four, one, six and seven anti-vaccination websites respectively. Two websites were common results of the terms “anti-vaccine” and “vaccine autism”. All websites examined are listed and categorized in Table 1 and Table 2. In Table 1, the general information to categorize a website were noted: Opposition to which vaccines were observed, whether it was a website against all or a selected vaccine, the subject of the website if it was a general subject website, whether the website produced its own content or copied it, and whether it defended some vaccines. The main subjects of the vaccine critical websites were quantified in Table 2.

Categorization of Websites

Of the resultant 16 websites, only one of those internet sites was vaccine specific while the rest were mostly on other topics (Table 1). Close to half of 16 websites (n=7) were on religion, halal food and food safety subjects combined (Table 2). These subjects accompanied each other variably but halal food was the predominant subject in six of those internet sites. The second most frequent subject was rehabilitation of autistic children (n=3), followed by personal websites (n=2). It was notable that, one of the personal websites belonged to a medical professor doctor who also appeared on the mainstream media.¹⁹ The other personal website included an internet page on a philosophical discussion of vaccine objection.²⁰

Table 2. Number of Websites According to Subject

Number of Internet Sites	Subject
7	Religion in general, halal food and food safety*
3	Rehabilitation of autistic children
2	Personal websites**
1	Parenting
1	Personal development
1	Issues of civil servants
1	Anti-vaccine

* Subjects accompany each other variably
 ** One of the internet sites belongs to a medical doctor (professor)

As most websites (n=10, 63%) were against all vaccines, the other six (n=6, 38%) were against only some vaccines, such as the two personal websites. For instance, two websites were against DPT and meningitis vaccine, and one was against swine flu vaccine only.

While most websites (n=13, 81%) relayed information from other websites, two personal internet sites and the website of Autism Foundation produced their own material. In the previous studies relay sites were described as websites that did not contribute original content but rather copied the vaccine critical content found on the Internet (Table 1).¹¹

Almost all websites which had references to religion focused on halal food. While four of those websites were particularly about food safety, the other three websites were about religion in general in which two of them also contained information about halal food. İhvanlar (Brothers), Gıda Raporu (Food Report) and GİMDES were against all vaccines whereas Gıda Hareketi (Food Movement) were against only some of the vaccines such as DPT, hepatitis B, meningitis, and influenza.²⁰

Table 1. List and Categorization of Websites

Name of Website	Opposition to Which Vaccines	Vaccine Specific	Subject	Own Material	Defense of Some Vaccines
On Vaccine	All	Mostly vaccine	Anti-Vaccine	Relay	0
Out of the Box	All	Mostly other	Personal Development	Relay	0
Brand Mother	All	Mostly other	Parenting	Relay	0
Ahmet Rasim Küçükusta	Some	Mostly other	Personal Website (Doctor)	Source	1
Can Başkent	Some	Mostly other	Personal Website on Politics, Academics and Human Rights	Source	1
Association for the Inspection and Certification of Food and Supplies	All	Mostly other	Halal Food, Food Safety	Relay	0
Wisdom	All	Mostly other	Religion in General, Halal Food	Relay	0
Ask A Question, Find An Answer	Some (Swine Flu Vaccine)	Mostly other	Religion in General	Relay	0
Food Report	All	Mostly other	Halal Food, Food Safety	Relay	0
Brothers	All	Mostly other	Religion in General, Halal Food	Relay	0
Exemplary	All (Foreign)	Mostly other	Halal Food, Food Safety	Relay	0
Civil Servants	Some (MMR particularly)	Mostly other	Issues of Civil Servants	Relay	0
Food Movement	Some (DPT, Hepatitis, Meningitis, Influenza)	Mostly other	Halal Food, Food Safety	Relay	1
Rehabilitation Autism Foundation	Some	Mostly other	Rehabilitation of autistic children	of Relay	1
Autism Foundation	All (Particularly DPT and Meningitis)	Mostly other	Rehabilitation of autistic children	of Source	0
Idealist Special Rehabilitators	All	Mostly other	Rehabilitation of autistic children (Nationalist tendencies)	Relay	0

Four websites defended some of the vaccines: The two personal websites, one website on halal food and an autistic child rehabilitation website. For instance Gıda Hareketi (Food Movement) supported the use of Hib (meningitis) and tetanus vaccine that do not have thimerosal, and measles vaccine alone not in combination form MMR.

Content Attributes

The number and percentage ratio of the content and design criteria analysis of the included websites were presented in Table 3 and Table 4 respectively. The quantities of the criteria were listed side by side with the data from the studies of Kata, Bean, and Ward et al for comparison.^{9,10,11}

Table 3. Comparison of Content Attributes

	Abbasoglu, (n=16)	Ward, (n=17)	Bean, (n=25)	Kata, (n=8)
CONTENT ATTRIBUTES				
Safety and Effectiveness	%	%	%	%
Vaccines contain poisons / are poisonous	88	94	80	100
Vaccines cause idiopathic illness, damage, or death	81		76	100
Vaccine immunity is temporary and/or erodes the immune system	50	47	32	88
Multiple simultaneous injections increase risk	19	29	12	38
Hot lots have more side effects	0	24		38
Adverse vaccine reactions underreported	13	41	36	63
Infectious diseases declined for other reasons	19	65	32	88
Diseases targeted by vaccines are trivial	25	41		50
Alternative Treatments				
Alternative health superior	19	29	20	88
Critiquing biomedicine/ Germ-Theory	25	35	4	75
Implied debate	31	71	16	38
Natural lifestyle gives immunity ("Back to nature")	38	35	24	88
Commercialism: alternative medicine	13	0		
Civil Liberties				
Parental rights	56		16	75
Monitoring	13			25
Totalitarianism: Excessive government control	50		20	63
Conspiracy Theories / Search for Truth				
Recommendation is motivated by profit	69	65	52	75
Collusion	6		20	63
Protection	0	59	20	
Cover up or lies	44	82	20	75
Support of rebel doctors	25	41	4	50
Foolish doctors	31			
Fear mongering	6		8	50

Table 3. Comparison of Content Attributes

Unusual theories	6	18	16	38
Privileged knowledge	0		8	50
Anti-science	13			38
Informed choices	25		24	38
Morality, Religion, and Ideology				
Religious tenets	44	0		25
Immoral acts	6	6	8	38
Anti-utilitarianism	0	0		13
Misinformation and Falsehoods				
Outdated sources	38		8	75
Misrepresentations	50		16	88
Self-reference	50		20	88
No references	75		8	38
Falsehoods	81			88

Table 4. Comparison of Design Attributes

	Abbasoglu			
	(n=16)	Ward (n=17)	Bean (n=25)	Kata (n=8)
Emotive Appeals	%	%	%	%
Personal testimonies	44	65	32	88
Pictures of victims of side effects	6	18	24	50
Images of needles (scary)	13	29	36	13
Us and them	44			50
Responsible parenting	56		76	50
Content Aspects				
Claim to present both sides (Non-partisan claims)	25	12	32	25
Actually present both sides (Unbiased)	19	6	4	13
Links to vaccine-critical websites	25	47	56	100
Links to vaccine-recommending websites	13	18	24	50
Authority / official status	56		12	25
How to legally avoid vaccines	31	12	32	50
How to declare adverse reactions	19	24	20	25
Links to lawyers	6	0		25
Commercialism (CD, DVD, Books)	0	41	44	75
Solicitations for contribution	0	41	24	63

Majority of the websites claimed vaccines contained poisons/toxins (n=14, 88%) and caused idiopathic diseases (n=13, 81%) such as autism. In one website it was stated that “No satisfactory scientific evidence had been found to demonstrate that these diseases didn’t

arise from vaccines” (Kuraldışı, Out of the Box).²¹ Half of the websites (n=8, 50%) argued that the vaccines eroded immunity or created only temporary or ineffective immunity. Four (25%) websites argued that the infectious diseases which the vaccines prevented were

uncommon and not contagious, and some of the vaccines in the vaccine program were questioned.

Misinformation and falsehood followed the safety theme in prevalence. While in 81% (n=13) of the websites, unsupported statements were observed, in 75% (n=12) of them a lack of reference was noticed. In all the internet sites that lack to show reference, falsehoods were present.

“Vaccine policies were based on profit” was the most utilized criteria under “conspiracy theories/search for truth” theme (n=11, 69%). This argument was supported by four more other websites as well as all the websites that argued about the violation of parental rights and totalitarianism. In one website, the vaccines were called “*commercial vaccines*” and another website stated that they were in the monopoly of only a few pharmaceutical companies and “*we serve capitalism with a social hysteria*”.

The second most utilized criteria under the conspiracy theories theme is “covers up” with 44% (n=7). In one of the websites it was claimed that the pharmaceutical companies try to hide the negative effects of vaccines at every stage by “*infiltrating the whole health system*”. It was perceived that pharmaceutical companies supported scientific evidence that was only in favor of vaccines, rendering the scientific information unreliable. It was also stated that the mainstream media overlooked the negative effects of vaccines “*There isn't one line on this subject, (MMR vaccine increasing autism) in the noble Turkish press ...*”²²

Parental rights were the most stressed criteria among civil liberties by 56% (n=9). Criticism of totalitarianism came second with 50%

(n=8). All the internet sites that had accused the government of totalitarianism also claimed the damaging of parental rights. It was notable that three of them were religious websites.

Particularly mandatory vaccination of infants seemed to affect parents' liberty and autonomy of taking decisions about their children. Although harassment of parents (monitoring) that refused to vaccinate was not a common argument, used only by two websites (13%), one of them quoted a mother that said “*Who are you to take my baby by force to vaccinate? If I don't find it appropriate to vaccinate, will they change my mind by coercion by police?*” mentioning the Ministry of Health.²³

Religious tenets were observed in 44% (n=7) of the websites. Usually, the claims rested on the arguments that the contents of vaccines such as swine gelatin and primate DNA (perceived by the Muslims to be forbidden by religion) were not regarded as “halal”.

“...*“it contains swine” is written in the package insert of the alternative of the same drug in a foreign country, it's omitted in ours*” (Gıda Raporu, Food Report 2015).²⁴ After this statement the health ministry was called to duty by the website. To quote another website, western capitalism was criticized by “*Unable to save our Muslim children from the arms of the octopus Western international pharmaceutical mafia...*” (İhvanlar, Brothers n.d.).²⁵

About a third (n=6, 38%) of the websites suggested a “back to nature” philosophy. “Natural” immune system was compared to immunity inducted by vaccines and perceived to be more protective and harmless. In one of the websites, it was stated that “*Vaccines don't*

*provide mucosal immunity. Microbial diseases that were naturally passed lends mucosal immunity. ...protects you from allergic and chronic inflammatory diseases” (Küçükusta 2015).*¹⁹

The implied debate criteria (n=5, 31%) were observed to be at a similar ratio. An example may be suggested by a website run by a professor of medicine: *“I favor every kind of health and illness related problem, not to be spoken behind closed doors but discussed before the society”*.¹⁹

By using discourse such as *“If there isn’t a certain risk until age two, no vaccine should be administered...”* the fallacy of established medical knowledge was claimed by four websites (n=4, 25%).¹⁹

Alternative treatment argument was observed in three internet sites (19%). These sites also contained the criterion of “Back to nature”. Alternative product sales such as vitamin D and fish oil were observed rarely in two websites (n=2, 13%).

Design Attributes

More than half of the websites (56%, n=19) studied included content that implied authority/official status and an equal number of websites defended voluntary vaccination by the choice of informed parents (56% n=9).

*“The people that were enlightened by complete and correct information will absolutely take the right decision” (Küçükusta 2015).*¹⁹

In five of the websites (n=5, 31%) information for legally avoiding immunizations were observed. Information regarding the parents that sued against compulsory vaccination and won, legal articles pointing the illegality of compulsory vaccination, and international

agreements were observed to be shared.

Few of the websites (n=3, 19%) allowed views of both pro and anti-vaccinationists. Anti-vaccination website links were given more frequently than the pro-vaccination website links (25% vs. 13%; n=4 vs. n=2). Imagery was used rarely (6%,13%; n=1,2) and parents mentioned about their experiences concerning their children (44%, n=7). Sale of products that contain antivaccination content or solicitations for support was not present in any of the websites.

DISCUSSION

The internet pages that our query yielded were last modified between years 2011 and 2015, preceding the major coverage of the vaccine hesitancy by the mainstream media by one or two years.

While comparing the results of similar studies, the methods applied should be taken into consideration. All the studies used Google according to their respective languages, but Bean also made use of other search engines.^{9,10,11} While Kata and Bean used three and ten general keywords respectively, Ward et al. also used keywords that reflected public debate such as “aluminum” and “papillomavirus”.^{9,10,11} While Kata and Ward et al. used a similar expanded exclusion list which also was used in this study, Bean used a former exclusion list by Wolfe et al.⁸⁻¹¹ While Ward et al screened 30 results, Kata screened 10 results at first but expanded it with 50 results concerning the Google.ca research and Bean beginning with screening 10 results per keyword, added websites that she found when she explored one of the resultant websites.^{9,10,11} Kata considered a website vaccine critical if it was opposed to

any childhood vaccine, Ward expanded this definition to any vaccine and in Bean's study no mention of such a definition were to be found.^{9,10,11} The number of websites evaluated by the methods of Kata, Bean and Ward were 8, 25, 17 respectively.^{9,10,11} It can be argued that these factors compromise the following comparisons that were done under this heading.

Although the presence of design and content criteria in Turkish speaking internet sites were less than English and French speaking websites, the comparison of frequencies between criteria in a single study showed similarity. For example, the presence of safety and effectiveness criteria usually were both high in all Turkish, English and French websites with respect to other criteria but the absolute frequency (%) of that criteria is less in Turkish websites.^{9,10,11}

Content Attributes

When evaluated according to content, the presence of "vaccines are poisonous" argument (88%) was found to be similar to English (Kata, 100%; Bean, 80%) and French (Ward, 94%) internet sites.^{6,7,8} The argument of "infectious diseases decreased because of reasons except vaccines" (19%) were used less than English (Kata 2010; Bean 2011) (88%, 32%) and French (Ward) (65%) internet sites.^{9,10,11}

The ingredients, especially thimerosal was perceived to be harmful and it was believed that a correlation between vaccine use and idiopathic illness had existed. It was stated in some websites that infectious diseases were replaced by several chronic diseases by interventions which vaccines were

also part of. A possible reason might be that correlation was taken for causality in some of the websites, as exemplified by "In 14 years that thimerosal was present in the vaccines, it was detected that the number of children who became autistic increased 15 times" (İbretlik, Exemplary n.d.).²⁶ The studies that had been done to this day showed no results favoring causality between vaccines and idiopathic chronic diseases.²⁷

The influenza vaccines were the target of criticisms in some websites. This may be due to both because of its partial protectiveness and of its being promoted often in Turkish media.

The high ratio of the presence of "conspiracy theories" criteria was notable. The "motivation by profit" criterion (69%) was emphasized by a majority of the websites similar to English (52%, 75%) and French websites (65%).^{9,10,11}

The presence of civil liberties criteria (parental rights 56%, totalitarianism 50%) were between the ratios stated by Bean and Kata: The presence of "parental rights" (16% Bean, 75% Kata) and "totalitarianism" (20% Bean, 63% Kata).^{9,10}

Criticism of biomedicine (n=4, 25%) and superiority of alternative medicine (n=3, 19%) were found to be low similar to studies done by Bean and Ward: "Criticism of biomedicine" (4% Bean, 35% Ward) and "Alternative health superior" (20% Bean, 29% Ward).^{10,11} The limited presence of alternative health products showed that anti vaccine sentiment still had not been commercialized as in the developed world. Modern medicine's involvements

in collusion of interests were implied such as by the use of words “discussed behind closed doors”.¹⁹

Content Attributes: Morality, Religion and Ideology

The query that yielded the second most number of websites (n=7, 44%) was “vaccine permissible in Islamic Law”. Religious reasons were observed higher (44%) than Kata’s study (25%) and French websites (0%) in which it was not observed at all.⁹

The common denominator among sites that had religious arguments was halal food, and food safety was also a common subject. Being parallel to food safety, the main arguments on the internet pages that had religious tones was “vaccine safety” and conspiracy theories regarding its compromise which were also commonly found on other websites. One of the internet sites gave theoretical support to vaccines which “*in the past was also used*”, but “*had anxieties*” about the “*content of imported vaccines*” which made them practically against all the vaccines available in the Turkish market (Gıda Raporu).²⁴

Some conspiracy theories were about Muslims becoming the victims in a conspiracy run by the Western pharmaceutical companies. One website accused these companies of implementing local doctors to be complicit in giving Muslim people substances derived from swine without indicating it (Gıda Raporu).²⁴ Another website called the pharmaceutical companies “*octopus western pharmaceutical mafia*” (İhvanlar).²⁵ The absence of anti-semitism which was

found in a qualitative research on the vaccine hesitant parents conducted in 2018 was also notable.²⁸

Most of the religious sites took American vaccine critical websites as references and examples of anti-vaccine struggle were drawn mainly from the USA. One such example given by GİMDES was a secret CDC meeting where Tom Verstraeten revealed data about the side effects of vaccines (GİMDES 2013).²⁹ The internet site İhvanlar, openly directs the reader for further reading to American websites such as www.vaccinationcouncil.org, www.vaclib.org; and to books such as “Natural Alternatives to Vaccination” by Zoltan Rosa MD. Examples of alleged incidences from Denmark and UK (Leicester) where the content of vaccines inappropriate in Islam were reported.²⁵

Unmet expectations, such as The Organisation of Islamic Cooperation’s alleged “halal vaccine” promise was mentioned in one website (Gıda Raporu).²⁴ Some of the internet sites asked for “scientific documents” to declare the vaccines halal and safe. Domestic vaccine production was offered as a solution by one of the websites (İhvanlar).²⁵

The evidences proved a close relation between the three internet sites that referred to religion. The website Gıda Raporu declared itself to be GİMDES in their mission statement.²⁴ Also, İhvanlar indicated Gıda Raporu as the source of their vaccine critical article.²⁵

Design Attributes

Personal testimonies were found in 44% (n=7) of the websites which was below 65%

found for French websites (Ward, 65%) and Kata's study that found 88% (Kata 2010; Ward et al. 2014).^{9,11} Bean's study that took more websites in English yielded 32% on these criteria which resembled the figure founded in our study.¹⁰ Needle (13%) and harmed children (%6) imagery were also used less than other studies. It could be said that Turkish websites were found to be less visual. Representation of both sides equally was more prevalent in Turkish (19%) internet sites than in English (4% Bean, 13% Kata) and French (6%) websites.^{9,10,11} Less websites showed commercialism compared to English and French websites that showed ratios around 50% (Bean and Ward).^{10,11} None of the websites asked for financial contribution which also signifies the Turkish websites were behind in capitalization than English and French websites on anti-vaccination. Links to pro-vaccine (13%) and anti-vaccine sites (25%) were less than the ones found on the other studies: Links to pro-vaccine websites 18% anti-vaccine websites 47% in Ward's study, 24% and 56% respectively in Bean's study.^{10,11}

In some websites the arguments suggested were occasionally referenced from a "Professor Doctor" who were claimed a hero. Other references were foreign language books, American Pediatric Association, WHO, court rulings and laws. These two factors might have increased the perceived reliability of information and interpretations supported by institutions of authority.

Limitations

One of the limits of our study was omitting the page ranking search for the results

of every query. Also, as noted in Ward's study, the users' research results would be customized by Google by mechanics that we don't have sufficient knowledge of.¹¹ But the results the researchers found with logged off Google accounts could be reflecting the average results. Another limitation was that two years had passed since the completion of the research phase of the study. During that time the ranking of some of the websites may have changed so that, they might not appear on our final list or new websites might enter the list. As of 04 November 2020, five websites were closed (one of them by court ruling), three of the closed websites continues on Facebook platform.

CONCLUSION

Because the Internet is widely used nowadays to access health information, it is of importance to evaluate the content and design criteria of the vaccine critical internet sites. They arguably represent the ideas of a part of society that has suspicions about vaccines. Part of the arguments used by and added to the repertoire of the individuals who are vaccine hesitant could be obtained from these sites.

The results of our study can be summarized as:

Most Turkish vaccine critical websites were general subject, relay websites. Criteria searched for vaccine criticism were generally less frequent in Turkish websites than in English and French websites. Despite these findings, religious reasons were observed higher in Turkish websites. The websites that supported religious tenets were usually about halal

food and borrowed heavily from American anti-vaccine websites.

Further studies can be conducted to evaluate the effect of COVID-19 pandemic to the spread and content of vaccine criticism on the internet. More importantly, an extended network analysis of the vaccine criticism on the web would give the scientific community more insight into how and which arguments diffuse in the society.

The Ministry of Health must also take into consideration that the emotive appeals and conspiracy theories available in vaccine critical sites are creating a compelling story telling environment. Ministry of Health should invest more in the Web, specifically targeting its response according to the criteria available in vaccine critical websites.

ACKNOWLEDGEMENTS

A summary of the study was presented in the 20th National Public Health Congress in Turkey and also is available in the 20th National Public Health Congress Book p. 1033-34.

Conflict of Interest: A.A., B.T.G., İ.Ü. and M.M.Ö. declare no conflict of interest.

Financial Support: The study did not receive any funding.

Ethical Declaration: Ethical approval was unnecessary for using publicly open information.

Author Contributions: Concept: AA, Design: AA, Supervising: MMÖ, Data collection and entry: BTG, İÜ, MMÖ, AA, Analysis and interpretation: AA, BTG, Literature search: AA, Writing: AA, Critical review: BTG, MMÖ

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