

Turkish and Slovenian health ministries' use of Twitter: a comparative analysis

Aydemir Okay

*Department of Public Relations, Faculty of Communication,
Abant İzzet Baysal University, Bolu, Turkey*

Pedja Ašanin Gole

*Department of Marketing, Social Media and Public Relations,
DOBA Faculty of Applied Business and Social Studies Maribor,
Maribor, Slovenia, and*

Ayla Okay

*Department of Public Relations, Istanbul University Faculty of Communications,
Istanbul, Turkey*

Abstract

Purpose – The purpose of this paper is to explore how the health ministries of Turkey and Slovenia use Twitter as government agencies obliged to communicate with the public.

Design/methodology/approach – This study employed a content analysis methodology to examine how Turkish (TR) and Slovenian (SLO) health ministries use Twitter for informing and encouraging behavior change in the public. A total of 662 “tweets” were analyzed. Drawing on prior studies, a coding scheme was developed and employed, and χ^2 and *t*-tests were conducted for data analysis. Additionally, this study aimed at effecting a content analysis according to the “four models” method of Grunig and Hunt regarding efforts made to build communication with the public.

Findings – This study uncovered that the TR and SLO health ministries did not utilize two-way communication principles for Twitter communication, and their frequency of Twitter use is inadequate.

Research limitations/implications – The sampled tweets were selected by using a scientific sampling method. However, this might not have been substantial enough to represent the entirety of tweets in the study timeframe. Analyzing tweets across a longer timeframe would be helpful in confirming this study's findings. This study was also limited to two countries and to publicly available tweets; the messages of health ministries' followers to the ministries themselves were not examined. The findings of this study may not be generalizable to other countries. Other potential studies, with a particular focus on this topic, may be able to measure individual perceptions of the credibility and usefulness of messages from health ministries and their willingness to engage in two-way communication.

Originality/value – This study is one of the first to evaluate how the health ministries of Turkey and Slovenia communicate on Twitter and to apply the four models of Grunig and Hunt with regard to Twitter. This study also identified that noncompeting government agencies were not minded to communicate with their publics.

Keywords Twitter, Health communication, Ministry of health, Turkey, Slovenia

Paper type Research paper

1. Introduction

In allowing for real-time and sometimes two-way communication, Twitter has served as an efficient and effective communication tool for sharing information and building dialogic relationships since 2006. Every second, an average of around 8,600 “tweets” are sent on



Twitter ([Internet Live Stats, 2019](#)). A total of 74% (62.07 million) of the population of Turkey (83.88 million) are active Internet users, while 54 million actively use social media. With its 11.8 million active users, Twitter ranks fifth in terms of most-used social media platforms in Turkey ([Hootsuite and We Are Social, 2020a](#)). In Slovenia, 81% (1.68 million) of the total population (2.08 million) are active users of the Internet, while 1.1 million actively use social media. In Slovenia, Twitter is the fourth most-used social media platform (4.08%), with 174,500 users ([Hootsuite and We Are Social, 2020b](#)). Capable of providing opportunities for direct communication with the public, Twitter is effectively used by both nonprofit and for-profit organizations, including government bodies and health ministries and their organizational units.

Healthcare organizations that use Twitter need to formulate a social media strategy, decide on what content to post publicly and learn how to effectively use Twitter, among other social media environments, to promote health-related messages. The use of Twitter in healthcare services is common worldwide. More than 100,000 healthcare professionals worldwide send nearly 300,000 tweets per day to over 135 million followers ([Lester, 2014](#)). Various studies have suggested that Twitter is an effective platform and one that is widely used by healthcare professionals to communicate with their publics ([Diddi and Lundy, 2017](#); [Gomes and Coustasse, 2015](#)). An analysis by Canadian healthcare professionals revealed that health services, personal health practices and education are the predominant tweeted themes, reflecting a variety of political and social healthcare issues ([Donelle and Booth, 2012](#)).

The role of Twitter as a health communication platform is not limited to the providing of health information to the public or the giving of guidance on avoiding potential health risks. Twitter does not always impose mutual connections on users, as some social media services do. This characteristic can lead to asymmetric connections on Twitter; such connections are likely to promote efficient and direct information distribution more readily ([Kim *et al.*, 2015](#)).

The general objective of this research is to analyze how the health ministries of Turkey and Slovenia use Twitter as government agencies obliged to communicate with their publics. In Turkey, a mixed national healthcare system is being implemented, with both private and state-owned healthcare institutions being active ([T.C. Sağlık Bakanlığı, 2003](#)). The healthcare system in Slovenia is based on public healthcare, with the collaboration of private healthcare mainly at the primary and secondary level. It is organized according to universal healthcare system principles and financed according to the Bismarck model, with compulsory and supplementary health insurance ([Toth, 2003](#)). Although the two countries have significantly different cultural and socioeconomic backgrounds, public health is a pillar of the health system in both. By choosing these two countries, our aim in this research was to go beyond the basic logic of comparative research of developing countries. Thus, we have addressed the gap in comparative work in the use of public relations models in the Twitter communication of the health ministries in both countries to reflect the importance of national political, cultural and social elements. This research may also provide health ministries with insights into how Twitter can be strategically used for different communication purposes, such as delivering health information, promoting services and events and creating dialog with the public.

2. Literature review

2.1 *Twitter as an effective social networking platform*

Social network sites (SNS) have become an important field in communication management and serve as a cost-effective, efficient, powerful health communication and promotional tool for healthcare organizations as well as for creating opportunities for individuals to disseminate health messages ([Novillo-Ortiz and Hernandez-Perez, 2017](#); [Bail, 2016](#); [Park *et al.*, 2013, 2016](#); [Heldman *et al.*, 2013](#)). On the subject of how best to use Twitter for health

communication, there are a number of different opinions. Health organizations mostly focus on one-way communication via social media by simply disseminating their message (Lovejoy and Saxton, 2012; Waters and Jamal, 2011; Rybalko and Seltzer, 2010; Bortree and Seltzer, 2009), while an understanding of two-way communication is critical in exploring the public's attitudes (Heldman *et al.*, 2013; Neiger *et al.*, 2013).

In light of the popularity and wide adoption of social network sites over the past few years, there has been increasing interest among healthcare organizations in optimizing the use of social media, especially in health communications (Kordzadeh, 2019; Guidry *et al.*, 2017; Novillo-Ortiz and Hernandez-Perez, 2017). A number of descriptive and longitudinal studies have found that some larger healthcare organizations are using one or more types of social media (Van de Belt *et al.*, 2013) but this often involves little interaction with their publics; many organizations use these platforms simply to "seed" information (Van de Belt *et al.*, 2012).

Some studies, however, have suggested that organizations use social media platforms to facilitate interactive communication with the public (Burton and Soboleva, 2011; Bortree and Seltzer, 2009). Lovejoy *et al.* (2012) suggested that Twitter's potentially contingent system of interactive messages, such as replies and mentions, can assist organizations in communicating with other users or the public in general.

A primary feature of Twitter is its capacity to provide dialogic loops through retweeting and the feedback mechanism of replies (Park *et al.*, 2016). Retweets and replies are central for generating a foundation for dialogic communication (Heldman *et al.*, 2013). Boyd *et al.* (2010) analyzed qualitative comments on Twitter practices. They found that people retweeted because they wanted to spread tweets to new audiences, indicate agreement with someone in a public way, validate others' thoughts and to save tweets for future reference. A message's "retweetability" represents message virality, meaning that engaged audiences experience a desire to share the said content with others online, offline or both (Hopp and Gallicano, 2016). The topic of a tweet also determines how many times it gets retweeted by other users. Scholars have argued that retweeting represents a higher level of engagement than "liking" and commenting and that the number of retweets can be used as a measure of online social influence (Huang and Yeo, 2018).

Sashi (2012) suggested that followers' use of "likes" can indicate a satisfactory level of interaction. Besides posting likes on Twitter, health organizations can take advantage of Twitter features such as mentions and hyperlinks to retain users and encourage followings by including links relevant to the organization (Rybalko and Seltzer, 2010). Followers of health ministries' Twitter accounts may act as information ambassadors, assisting in disseminating information and promoting their services, educational programs or events.

Supplementary information in tweets can be added as hashtags and URLs. The use of hashtags denotes that a message is relevant to a particular topic. Hashtags work best when they have been established and agreed upon, which usually happens when an organization recommends a specific hashtag for use by those interested in an event or conversation (Lovejoy *et al.*, 2012). The use of hashtags may be particularly effective when dealing with a large-scale disaster or health campaign, which requires up-to-date information to be made available and shared widely in a timely manner. Adding URLs in tweets can also significantly contribute to "retweetability" (Suh *et al.*, 2010). Third-party websites have been created to help users share information as hyperlinks on Twitter. To share hyperlinks, many health organizations take advantage of URL-shortening services, in accord with Twitter's character restrictions (Lovejoy *et al.*, 2012).

The use of photos and videos is another effective way of delivering information in an easy-to-understand format. Health tips and information on ministerial events that are supplemented with photos and videos may assist the dissemination effort and thus increase the public's perception of the content's usefulness (Bernhardt *et al.*, 2011).

2.2 The four-model approach of Grunig and Hunt

Grunig's four-model approach is basically classified according to whether models are one-way or two-way and whether they are of a symmetrical or an asymmetrical nature. Grunig identified two patterns of public relations practice, which he described as "synchronic" and "diachronic", using Thayer's (1968) concept of two types of communication. Grunig and Hunt (1984) extended these two types into the concept of four models of public relations, both as a way of describing the historical development of public relations in the US and as a set of ideal types that describe typical ways in which contemporary public relations is practiced. These four models were named as follows: press agency/publicity, public information, two-way symmetrical and two-way asymmetrical. The first two models are one way. Practitioners of press agency seek attention for their organization in almost any way possible, whereas public-information practitioners are journalists in residence who disseminate accurate, but usually only favorable, information about their organizations. With the two-way asymmetrical model, practitioners conduct scientific research to determine how to persuade publics to behave in the way the organization wishes. With the two-way symmetrical model, practitioners use research and dialog to bring about symbiotic changes in the ideas, attitudes and behaviors of both the organization and its publics (Grunig and Grunig, 1996). Grunig (1989) argued that these four models can be collapsed into two world views, with the asymmetrical models being instrumental and the symmetrical models being reciprocal in nature.

2.3 Message functions and topics in healthcare

Twitter is the most commonly used platform available for the one-way sharing of information without consideration of stakeholders' needs and preferences (Thackeray *et al.*, 2012a, b). As content posted on Twitter might have different functions, such as information sharing, problem solving and public relations (Leek *et al.*, 2019), some tweets may generate more engagement than others, according to their content. It is suggested, therefore, that ministries should diversify their information-sharing, relationship-building strategies.

Lovejoy and Saxton (2012) developed a typology for the identification of three main categories of tweets: (1) information, which reports news, facts or event highlights (one-way presentation of information, the purpose of which is to inform or promote); (2) community, which focuses on interaction, sharing and conversation with followers to facilitate the creation of an online community and (3) action, which includes tweets that encourage followers to take action in favor of the body in question. They found that most messages (59 %) involved the one-way distribution of information. Based on Lovejoy and Saxton's original classifications, findings also indicate that health organizations implement one-way communication on social media for the purpose of distributing messages rather than engaging in two-way communication with their publics (Harris *et al.*, 2013; Neiger *et al.*, 2013; Thackeray *et al.*, 2012a, b). Saxton and Waters (2014) pointed out that people tended to prefer dialogic messages from nonprofits, which involved relationship building rather than the receiving of information.

These studies show that identifying different categories of messages from tweets can favor the gaining of in-depth insights. For the delivering of an effective message, its purpose (i.e. the message function) needs to address the public precisely. Healthcare organizations can use different message function types to achieve diverse tasks (Leek *et al.*, 2016): message functions can be explained as achieving different communication purposes through the delivery of different types of message.

To examine how the health ministries are using Twitter's communication features and for what topics, a number of research questions were asked:

- RQ 1. How do health ministries use the features of Twitter – (1) retweet and reply functions, (2) hyperlinks, (3) hashtags, (4) photos and (5) videos and illustrations – for public engagement?
- RQ 2. What activities are being communicated by the health ministries of Turkey and Slovenia?
- RQ 3. What message functions do the health ministries' tweets serve, based on the manifest content of tweets?
- RQ 4. What topics do health ministries' tweets cover?
- RQ 5. How do health ministries use Twitter, according to Grunig and Hunt's four models of public relations?

3. Methodology

This study used content analysis to examine how Turkish (TR) and Slovenian (SLO) health ministries use Twitter as a tool for communication and for informing and encouraging behavior change in their publics. Located in totally different geographical regions, Turkey and Slovenia were selected to reveal both divergent and similar aspects, using the convenience sampling method. This paper aimed at identifying possible differences between the use of Twitter accounts by health ministries in the two countries.

3.1 Sampling

The TR and SLO health ministries' official Twitter accounts were selected in order to compare them at the outset of data collection in March 2019. These two regulatory bodies are top ranked in terms of their healthcare system. Twitter use was examined through looking at only the main accounts of each health ministry: @saglikbakanligi and @MinZdravie. The sampling frame consisted of tweets posted on the health ministries' accounts during an almost one-year period from June 1, 2018 to April 30, 2019. This date range and timeframe was selected for the purpose of reviewing the most recent tweets up until May 2019.

A total of 662 tweets were analyzed. This paper compiled tweets from both health ministries every other month within the above-mentioned timeframe of 11 months from June 2018. This means that this research involved a six-month sampling of tweets. The sampling and coding of tweets occurred in May 2019. At the beginning of the data collection, the TR health ministry generated 14,700 tweets and had 439,000 followers, and it followed 12 accounts; the SLO health ministry put out 1,515 tweets and had 1,336 followers and followed 384 accounts.

3.2 Coding reliability and procedures

Three coders (two from Turkey, one from Slovenia) were used for coding within categories defined at the data collection stage. The criteria of classification, the content and a sense of the categories were explained to the coders, in order to enhance intercoder reliability. They were given the necessary training after which 60 samples, corresponding to approximately 10 % of the total samples incorporated in the current study, were randomly selected. Tweets in TR and SLO were translated into English, and the coding form was pretested. At the pilot study stage, intercoder reliability was calculated and any necessary corrections duly made to the coding form (Wimmer and Dominick, 2014).

The Krippendorff's alpha was used to calculate intercoder reliability. Kalpha, which was developed by Krippendorff and which functions in full integration with the SPSS program, was used to calculate the value (Hayes and Krippendorff, 2007). The Krippendorff's alpha

was calculated and reported according to the measurement levels of all the variables included in the coding form, the lowest calculated for each variable being 0.8172. As this is above 0.80, it is within the acceptable limit for all variables related to Krippendorff's alpha values for intercoder reliability in a pilot study (Wimmer and Dominick, 2014; Krippendorff, 2004a, b). After the pilot study, all samples were divided into three coders, and the coding was accomplished.

3.3 Coding categories

The coding instrument consisted of four parts corresponding to the research questions: (1) key Twitter features used in a tweet, (2) activities of health ministries, (3) message functions and topics and (4) the category of the “four models” of Grunig and Hunt to which the item conformed. Most of these coding categories were adapted from previous social media research (Capriotti and Ruesja, 2018; Leek *et al.*, 2016; Park *et al.*, 2013, 2016; Neiger *et al.*, 2013; Lovejoy and Saxton, 2012) and modified to fit the context of this study.

3.4 Descriptive variables and Twitter features

Each tweet was first coded, for categorization purposes, according to the following basic descriptive variables: (1) date, (2) the type of tweet (original or retweet), (3) number of replies, (4) number of retweets republished by other users and (5) number of “favorites” the tweet received. Each tweet was also coded for the presence or absence of hashtags and their subjects, hyperlinks, photos (including how many), videos, video length and how many people watched these and illustrations.

In analyzing the activity of the TR and SLO health ministries on Twitter, we also checked whether the accounts were active or inactive. Levels of intensity of tweeting were grouped based on Collier (2014), SocialBakers (2013) and Capriotti and Ruesja's (2018) studies. According to these reports, an adequate intensity of tweeting is between three and five tweets per day.

3.5 Message functions and topics

The message function and topic of each tweet was coded in two steps. First, tweets were categorized as covering either ministerial-related or personal health-related topics. This classification was defined according to whether the focus of the tweet was on ministerial events and activities or the individual's health knowledge and behavioral change. Second, each tweet was specifically coded for its most salient topic. There were 12 categories (including “others”) for ministerial-related topics and eight categories (including “others”) for personal health-related topics (See Table 1). The topic categories were grouped according to three message functions based on Lovejoy and Saxton's (2012) approach: information, community and action. These were applied to all tweets.

Messages posted in each tweet were also examined according to Grunig and Hunt's public relations models.

Feature	Turkish health ministry	Slovenian health ministry
Hyperlinks	64 (11.5%)	14 (13.4%)
Hashtags	246 (44.1%)	9 (8.6%)
Photos	197 (35.3%)	62 (59.5%)
Videos	132 (23.7%)	4 (4.3%)
Illustrations	177 (31.7%)	9 (8.6%)

Table 1.
Use of twitter features
by Turkish and
Slovenian health
ministries

4. Findings

Of a total of 662 tweets collected for analysis, 558 (84.3%) came from the TR health ministry and 104 (15.7%) from the SLO health ministry. On average, each tweet was “favorited” by 497.9 users (SD = 872.6). For the TR health ministry, the numbers of retweets and favorites averaged 172 (SD = 191.8) and 562.2 (SD = 908.5), respectively. The means of the numbers of retweets and favorites for the SLO health ministry were 2.09 (SD = 2.5) and 6.32 (SD = 16.9), respectively.

4.1 Features of Twitter (RQ1)

Nearly 53.6% ($n = 355$) of the tweets appeared to be original posts, followed by retweets at 46.4% ($n = 307$) and replies (90.76%, $n = 600$). This tendency was apparent for both the SLO and TR health ministries. Both ministries posted original tweets most often (TR, $n = 280$, SLO, $n = 75$) but they differed in the degree to which they used retweets (TR, $n = 278$, SLO, $n = 29$).

An independent samples t -test was conducted to compare the number of replies, number of retweets and number of favorites in the original tweets and retweets of the TR ministry of health. Regarding the number of replies, there was a significant difference between the means for original tweets ($M = 38.21$) and retweets ($M = 177.22$); $t(307.400) = -7.151, p = 0.000$. Also, for the number of favorites, there was a significant difference between the means for original tweets ($M = 356.82$) and retweets: ($M = 769.12$); $t(377.009) = -5.485, p = 0.000$. There were no significant differences in the numbers of those who retweeted original tweets or retweets of the Health Ministry. These results suggest that Twitter followers of the TR health ministry reply more often to the ministry’s retweets than to their original tweets. Furthermore, followers “like” the retweets more often than the ministry’s original tweets. Considering the t -test results for the SLO ministry’s original tweets and retweets as well as likes and replies, no significant differences were found.

An independent samples t -test was conducted to compare the number of replies, number of retweets and number of favorites in the tweets of the TR and SLO health ministries. Regarding the number of replies, there was a significant difference between the means for the TR ministry ($M = 107.47$) and the SLO ministry: ($M = 1.13$); $t(557.572) = -10.508, p = 0.000$. Also, regarding the number of retweets, there was a significant difference between the means for Turkey ($M = 172.06$) and Slovenia ($M = 2.09$); $t(558.029) = 20.916, p = 0.000$. There was also a significant difference between the number of favorites for the tweets of the TR ministry ($M = 562.23$) and those of the SLO ministry: ($M = 6.32$); $t(559.941) = 14.435, p = 0.000$. These results indicate that in all types of Twitter interaction, based on replies, retweets and favorites, TR people are more actively interacting with their health ministry’s Twitter account than SLOs.

A chi-square test of independence was performed to examine the relation between countries and tweet types. The relation between these variables was significant: $\chi^2(1, N = 662) = 16.962, p < 0.01$. The number of original tweets and retweets depends on the country: the TR health ministry put out more tweets as retweets; with the SLO health ministry, there were more original tweets than retweets.

Of the Twitter communication features analyzed, photos (39.1%, $n = 259$), hashtags (38.5%, $n = 255$) and illustrations (28.1%, $n = 186$) were found to be the most frequently used tools. The SLO health ministry used hyperlinks (13.4%) and photos (59.5%) more frequently than did the TR health ministry (11.5%), and the latter used hashtags, videos and illustrations more often than their counterparts.

A chi-square test of independence was performed to examine the relation between the two countries’ health ministries and their hashtag usage on Twitter. The relationship was

significant: $\chi^2(1, N = 644) = 35.217, p < 0.01$. The TR health ministry uses hashtags more frequently than the SLO health ministry.

A chi-square test of independence was also performed to examine the relation between the ministries and their hyperlink usage on Twitter. This relation was not significant: $\chi^2(1, N = 645) = 1.513, p > 0.05$. Neither ministry tends to use hyperlinks in its tweets.

A chi-square test of independence also examined the relation between the ministries in terms of their photo usage in tweets, and this relation was found to be significant: $\chi^2(1, N = 662) = 21.753, p < 0.01$. Though their tweeting frequency is relatively low, the SLO health ministry uses photos more frequently than the TR ministry.

An independent samples *t*-test was conducted to compare the number of photos per tweet in the two ministries. There was found to be a significant difference between the means for Turkey ($M = 1.35$) and Slovenia ($M = 1.60$); $t(660) = -4.735, p = 0.000$. When photos are used in tweets, the SLO health ministry tends to use more than the TR. However, the situation is different regarding the usage of illustrations, where the TR usage is greater: ($\chi^2(1, N = 646) = 17.127, p < 0.01$).

A chi-square test of independence was performed to examine the relation between the two ministries' video usage on Twitter. The relationship was significant: $\chi^2(1, N = 662) = 21.075, p < 0.01$. Compared to the SLO ministry, the TR ministry makes greater use of videos in their tweets.

A comparison of the number of people who watch the tweeted videos was checked with an independent samples *t*-test; the results comparing the means for Turkey ($M = 17579.58$) and Slovenia ($M = 3094.75$) were not significant: $t(134) = 1.147, p = 0.254$. In the two countries, there is no significant difference in the number of people who watch the videos shared by the health ministries, as a percentage of users.

4.2 The activity of the health ministries of Turkey and Slovenia on Twitter (RQ 2)

In order to perform an analysis, an interaction level was selected (see Table 2). This made it possible to find out the degree of interaction and to obtain the number of interactions per post for each ministry. Because there is a considerable difference between the number of tweets from the two ministries, only those generated by the TR ministry were addressed.

The academic literature reveals that accounts posting three to five tweets on a daily basis are considered "active". Accordingly, the frequency of Twitter use by the TR health ministry could be deemed "generally low" across the whole period of examination, although it was "adequate" in February 2019 (a total of 106 tweets) and "high" in April 2019 (a total of 153 tweets).

4.3 Message functions and topics (RQ 3)

A chi-square test was performed to examine the relation between ministries in terms of the message functions of their tweets. This relation was found to be significant: $\chi^2(2, N = 662) = 21.576, p < 0.01$. In terms of message functions being either personal

Category	Dimension	Options
Activity (tweets)	Intensity	
	Inactive	Zero tweets
	Quasi inactive	Less than one tweet per week
	Very low	Less than 15 tweets per week
	Low	Between 15 and 25 tweets per week
	Adequate	Between 25 and 35 tweets per week
	High	Between 35 and 45 tweets per week
	Very high	More than 45 tweets per week

Table 2. Intensity of the activity of on Twitter (Capriotti and Ruesja, 2018, p. 244)

health-related or private message of ministry, the TR health ministry issued more tweets than the SLO ministry. The latter, in contrast, generated more tweets on ministry-related topics than those of a personal health-related or private nature.

To further examine specific topics addressed by both countries' health ministries' tweets, this paper further classified each of the two main categories (i.e. ministry-related and personal health-related) according to three message functions: information, community and action. The chi-square statistics, however, were not investigated for message functions (ministry-related and personal health-related) for comparison purposes. Because a chi-square neglects a hypothesis on expected count, this paper had no clue about whether results are significant or not. To perform an analysis, a recoding was executed to reduce ministry message functions to three main categories, data under the categories of "information", "community" and "action", in reflection of the current paper's remit. To analyze health-related messages, this research created a new set of data, reduced to two categories: "information" and "action". According to the message functions analysis, the majority of the tweets were informative (78.5%, $n = 252$), whereas action-related tweets made up just a small portion of the sample (14.95%, $n = 48$). The number of ministry-related messages appeared to be less than community-related tweets (6.54%, $n = 21$). To summarize this finding, the primary purpose of the tweets appeared to be to inform people about ministerial events.

A chi-square test of independence was performed to examine the relation between the two ministries and their use of message functions when tweets are ministry related (Table 3). The relationship was significant: $\chi^2(2, N = 321) = 11.350, p < 0.01$. Thus, the TR ministry sends

	TR Fre	SLO Fre	Total Fre
Ministry related			
Inform- informing about ministerial events	205	21	226
Information sharing of personal stories and experiences	2	24	26
Comm- recognizing and giving thanks	7	1	8
Comm- acknowledging current events	9	3	12
Comm- encouraging users to give feedback	0	1	1
Action- promoting ministerial events and services	11	17	28
Action- encouraging donations and support	1	2	3
Action- calling for volunteers and employees	1	0	1
action- encouraging people to spread information	7	0	7
Action- inviting people to join another site	1	0	1
Action- soliciting people to learn how to help	8	0	8
Others	41	11	52
Total	293	80	373
Personal health related			
Inf- reporting medical research on the disease	3	1	4
Inf- delivering public health information	73	4	77
Inf- informing people about health risks	15	4	19
Inf- addressing social or political issues	2	0	2
Action- encouraging to receive health screenings	21	4	25
Action- encouraging behavior changes	34	2	36
Action- soliciting to take action to increase knowledge	9	2	11
Others	10	0	10
Total	167	17	184

Table 3.
Turkish and Slovenian
health ministries'
message functions and
topics on Twitter

more messages which are informative; the SLO ministry also uses the information function but uses “action” messages more in comparison.

According to the analysis of personal health-related message functions, the majority of the tweets were informative (58.62%, $n = 102$), whereas action-related tweets made up just a small portion of the sample (41.37%, $n = 72$). The primary purpose of the tweets appeared to be to inform people of public health information and to encourage behavior changes.

A chi-square test of independence was performed to examine the relation between the countries’ ministries and their use of message functions when tweets are personal health related. The relation was not significant: $\chi^2(1, N = 174) = 0.251, p > 0.05$. Both ministries tend to make use of information-related messages when tweets are personal and health related.

4.4 Topics (RQ 4)

The majority of the tweets were about ministry-related topics (56.34%, $n = 373$), whereas personal health-related tweets made up just a small portion of the sample (27.79%, $n = 184$). Private messages were found to be posted less frequently, but the total number of private messages was at a rate that should not be underestimated (15.86%, $n = 105$). A comparison of the two countries indicated that the SLO health ministry (76.92%) and the TR health ministry (52.5%) were both much more likely to post ministry-related tweets than personal health-related tweets (16.34 and 29.92%, respectively). However, private message tweets were posted more commonly by the TR ministry (17.56%) than the SLO (6.73%).

4.5 Grunig and Hunt’s models (RQ 5)

To examine the relation between the two countries’ ministries in terms of Grunig and Hunt’s four models of public relations as they apply to usage of Twitter, a chi-square test was performed (Table 4). The relation was not significant: $\chi^2(2, N = 659) = 0.666, p > 0.05$. The ministries did not differ in their use of Twitter in terms of public relations models. Both mostly make use of press agency/publicity public relations functions; the remainder of their efforts is mostly concentrated on informing the public. The use of the two-way asymmetrical model was found to be very rare in both countries.

In order to perform the analysis, Grunig and Hunt’s public relations models were reduced to three categories: “press agency” and “public information” remained as separate models, while “symmetrical” and “asymmetrical” were combined as one category. The category “mixed model” was removed, as data of this type is extremely scarce.

			Press agency publicity	PR models Public information	Two-way asymmetric model	Total
Country	Turkey	Count	321	199	35	555
		Expected count	317.5	201.3	36.2	555.0
	Slovenia	Count	56	40	8	104
		Expected count	59.5	37.7	6.8	104.0
Total		Count	377	239	43	659
		Expected count	377.0	239.0	43.0	659.0

Table 4.
Countries and Grunig
and Hunt’s four models
of public relations
cross tabulation

5. Discussion

This research provides insight into the use of Twitter in healthcare. In this section, this paper examines practices held in common as well as differences between the TR and SLO health ministries to extend the principles of the two-way models and to identify further opportunities for Twitter use in healthcare.

Retweets from the TR health ministry mostly comprised messages from the personal account of the Minister of Health. Among these messages were celebrations of official and religious days; celebrations of medalists; inaugurations of subways and mosques; 100-days government programs and so on. The majority of these were not directly linked to health or ministry-related issues. Such messages were retweeted by the official account of the TR ministry of health. A retweeted post attracted 11 posts at the minimum and 3,289 posts at the maximum. [Boyd et al. \(2010\)](#) findings state that the topics of Twitter messages account for their retweeting. Time-sensitive information, breaking news and “trending” topics were most likely to be republished; but it is difficult to apply this in the current case, as in both countries, tweets are retweeted or these retweets receive more likes. Tweets posted by health ministers attract more followers than tweets posted generally by the health ministries.

Although the number of replies in response to tweets is generally associated with a perfect interaction, a random scan of such replies revealed that a great number of posts are not directly related to the message of the tweet; there is no interaction between the replies and the tweets.

The number of “likes” for messages retweeted by the health ministry was found to be higher than that for tweets originally posted by the ministry. Tweets on the ministry’s official account received 38 likes as a minimum and 17,000 as a maximum; this may imply that “likes” are likely to be from people furthering political interests, as the Minister of Health has a political identity.

Although 246 tweets posted by the ministry were found to bear hashtags, only 73 of these included a health-related campaign, while 173 included separate incidents. [Huang and Yeo’s \(2018\)](#) findings indicate that including hashtags in tweets significantly increases “retweetability”; however, this study found the use of hashtags in tweets were meaningless for retweets. Hyperlinks were used very rarely (only in 64 cases).

One-third of tweets included photos and 117 tweets which carried no photo included illustrations. Almost 95 % of tweets with a photo included at least one or more photos of the Minister of Health; 112 tweets bore 1 photo, while 2 photos appeared on 27 tweets, 3 on 17 tweets and 4 on 41 tweets.

A total of 132 tweets showed videos featuring a variety of topics. Videos displayed successively consisted of sections of speeches by the Minister of Health. The length of these videos ranged from 5 seconds to 71 minutes. Their view rate varied from 335 to 224,000 viewers.

When the content of tweets is examined according to Grunig and Hunt’s models, 57.5% were found to belong to the “press agency” model and 35.7% to the “public information” model. This means that more than 90% used one-way communication, with the two-way models found in only 6%. Thus, it can be concluded the Twitter account of the health ministry delivers mostly one-way messages. Of the 252 Twitter messages issued by the ministry of health, 207 were one way. As for the personal health messages, 93 out of 157 messages also involved one-way information. It is clear that the TR health ministry mostly employs Twitter as a one-way channel for the dissemination of its opinions and thoughts; it is not taking advantage of the dialogical features of this platform and not interacting with its followers.

During the observed period, three ministers were replaced at the head of the SLO health ministry (meanwhile, there were also elections and a new government). Nevertheless, there was no major change in their communication via Twitter.

This study also examined healthcare topics addressed by the ministry and personal health-related and private tweets, in order to provide insight into the nature and content of the tweets as well as who issued them. The vast majority of tweets were ministry-related (76.9% of all tweets) and only 16.3% were personal health-related. Most tweets were not equipped with any hashtags (89.5% of all tweets in the observed period) or hyperlinks (83.9% tweets lacked hyperlinks); however, more than half (59.6%) were equipped with a photo (usually, a photo of the Minister). Most tweets were original (72.1%) and over a quarter of all posts (27.9%) were retweets, in principle, from organizations associated with the ministry.

Original tweets referred mainly to the promotion of each new SLO Minister for Health or to information about events attended by the Minister. More than half of all posts (53.9%) did not receive any reply; over a quarter (26.9%) received one reply; a low one-fifth (18.3%) received two to eight replies and one tweet received 18 replies. However, 82.7% of all posts were retweets (the maximum number of retweets was 17), mainly by ministry officials or political supporters of the current minister. There was a similar situation with “favorites”, only a third of posts (29.8% of all posts) were without favorites, while the remainder received an average of four favorites (a maximum of 134).

The content of these posts is indirectly related to current health problems. However, it seems this is only with a desire to showcase each new minister (something) is working, without substantive information on the resolution of any specific health problem. If such a “direction of travel” is already evident, then this consideration was at the declarative level only.

During the period under review, the SLO health ministry published four videos of the length of 25 seconds – 41.25 minutes (the latter a retweet of the broadcast of a press conference), which was watched by 12,379 Twitter users. Most attention was given to a 31-seconds video call for vaccination against influenza (11,091 insights) and the least to a (retweeted) direct transmission of the press conference mentioned above (only 91 views). A total of 64 tweets were equipped with photos (mostly with one photo only; two photos were published in two tweets) and nine tweets had illustrations.

In the tweets of the SLO health ministry during the period under review, one-way information prevailed with interaction at an extremely low level. [Rybalko and Seltzer \(2010\)](#) found that most organizations underutilize the platform and its capacity for symmetrical, two-way communication. [Waters and Jamal \(2011\)](#) also found that despite its capacity for two-way communication, many organizations use Twitter in a unilateral manner, as an information-sharing platform rather than for relationship building. The current research’s findings were of a similar nature.

This paper suggests that usefulness of information is rather weak in the ministries of health, at least when measured according to the degree of mutual interaction.

Both countries’ ministries’ tweets tended to be original and original tweets put out information. However, it is difficult to conclude whether or not the given information was wellreceived by followers or not, as the level of interaction was low.

6. Conclusion

This study discovered that using Twitter as a way to operationalize usefulness always should not be considered when applying dialogic communication to Twitter, as the tweets of the TR Health Minister are retweeted more frequently than those of the official Twitter account of the TR health ministry.

Concerning both ministries’ Twitter activity, it could be suggested that neither are performing well in their use of this platform as an effective communication tool. Both persist in using Twitter as a one-way channel to disseminate opinions and information to their publics, and the intensity of activity is low in both countries (especially in Slovenia). At first

glance, this seems to overlap with the one-way information giving function identified by Lovejoy and Saxton (2012) (e.g. Grunig and Hunt, 1984). However, closer examination of the content of the tweets using this strategy revealed nonintensive, individualized interactions with the ministries' publics. In contrast, Lovejoy and Saxton's (2012) coding scheme simply labels such tweets as "information-giving".

TR and SLO health ministries primarily used Twitter to disseminate original content; retweeted posts came second. Lee and Sundar (2013) found that high-authority health information sources, such as ministries of health, need to first build a substantial number of Twitter followers before they can rely on the credibility of others and retweet health information. Therefore, it is suggested these ministries should consider retweeting content from health information sources (not from political persons) that have a large number of Twitter followers, if they want to build up their own follower base.

The use of photos or videos by health ministries suggests an opportunity for health communication. Given that so much health communication matter is instructive and reliant on how-to illustrations, these features could extend or enrich the message content. However, the use of photographs and videos by the TR health ministry has become almost a propaganda tool for both the ministry and the Minister himself. Materials supporting the message content could be used to further clarify the subject; rather than using tweets primarily as a means to disseminate institutional information, health ministries might engage more personally with followers by complementing institutional community building and action-oriented tweets with those that address personal health issues.

Twitter can not only play a significant role in informing people of important health information but can also serve as an interactive communication tool between health ministries and their publics by allowing them to make comments and ask questions. In spite of this beneficial characteristic of Twitter, this paper revealed that both countries' health ministries have, in contrast, used Twitter as a unidirectional messaging tool and not for two-way communication.

6.1 Limitations

The sampled tweets were selected by using a scientific sampling method. However, this might not have been substantial enough to represent the entirety of tweets in the study timeframe. Analyzing tweets across a longer timeframe would be helpful in confirming this study's findings. This study was also limited to two countries and to publicly available tweets; the messages of health ministries' followers to the ministries themselves were not examined. The findings of this study may not be generalizable to other countries. Other potential studies, with a particular focus on this topic, may be able to measure individual perceptions of the credibility and usefulness of messages from health ministries and their willingness to engage in two-way communication.

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Corresponding author

Pedja Ašanin Gole can be contacted at: pedja.asanin-gole@net.doba.si

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