Journal of Medical and Health Studies
ISSN: 2710-1452
DOI: 10.32996/jmhs
Journal Homepage: www.al-kindipublisher.com/index.php/jmhs

JMHS
AL-KINDI CENTER FOR RESEARCH AND DEVELOPMENT

| RESEARCH ARTICLE

Understanding Citizens' Tweets During and After the COVID-19 Pandemic in Saudi Arabia: A Thematic Analysis Study

Maha Abdulghafar Alayyash[1] ✉ and Raghad Naif Althobaiti[2]

[1]Assistant Professor of Applied Linguistics, Department of English, College of Languages and Translation, University of Jeddah, Jeddah, Saudi Arabia

[2]A Graduate Student, Department of English, College of Languages and Translation, University of Jeddah, Jeddah, Saudi Arabia

Corresponding Author: Maha A. Alayyash, **E-mail**: maalayyash@uj.edu.sa

| ABSTRACT

The coronavirus began in December 2019; in Wuhan, China, later the virus spread rapidly within a relatively short period of time, causing a global pandemic. Therefore, the Saudi government responded to the threat of COVID-19 from the start by imposing a lockdown to curb the number of affected patients and to prevent the fast-spreading virus, such as turning to distance learning, banning travel, imposing curfews, and postponing social activities. As social activities and social communication were affected by the crisis, people in Saudi Arabia tend to increasingly use social media platforms, one of which is Twitter. Little is known about the Saudis' reactions on Twitter during COVID-19 and after. Therefore, the present study aims to investigate how Saudi Twitter users express their feelings qualitatively during and after COVID-19 outbreaks. For the scope of this study, Arabic tweets related to COVID-19 expressed by Saudi citizens were collected from Twitter using the web scraping service Apify. The data covered the periods of COVID-19 from the 1st of January 2020 to the 7th of July 2022. The selection of these tweets was primarily based on trending hashtags and keywords populated from Saudi Arabia. A total of 11,900 Arabic tweets were obtained, and only 473 tweets were considered in this study. A qualitative thematic analysis of Saudis' tweets resulted in the identification of five main themes: 1) negative attitudes (i.e., fear, frustration, and sadness, 309, 65%); 2) positive attitudes (56, 12%); 3) advise-giving (48, 10%); 4) humour (34, 7%); and 5) information-seeking (26, 5%). These findings suggest that Saudi governmental agencies should actively engage in two-way communication with the public, provide trustworthy information, and manage the crisis based on the public's needs. Our present research has shown that Twitter is a valuable source of reality, reflecting unique experiences among its users. Thematic analysis has proven to be a useful approach in providing insightful information about the Saudis' needs in times of crisis and after. In addition, governments and health authorities can have a better understanding of the public's needs and thus prepare their crisis management strategies in order to relieve the public's psychological pressures.

| KEYWORDS

COVID-19; Twitter ; Arabic tweets; Saudi Arabia ; Thematic analysis; attitudes; Global pandemic

| ARTICLE INFORMATION

ACCEPTED: 20 June 2023 **PUBLISHED:** 30 June 2023 **DOI:** 10.32996/jmhs.2023.4.4.4

1. Introduction

The coronavirus disease is a newly arising pandemic caused by severe acute respiratory syndrome, the SARS-CoV-2 virus. The virus began in December 2019; in Wuhan, China; later, the virus spread rapidly within a relatively short period of time, causing a global pandemic. COVID-19's symptoms vary from one person to another, as some patients experience mild to moderate symptoms (Alkhamees et al., 2020). In March 2020, COVID-19 was announced as a global pandemic by the World Health Organization (WHO). The worldwide health system was in preparation as a response to this global pandemic due to the hundreds of affected countries (219) and territories within the first few weeks (Remuzzi and Remuzzi 2020). As of the 8th of July 2022, there have been 551,226,298 confirmed cases of COVID-19, including 6,345,595 deaths, and a total of 12,037,259,035 vaccine doses have been

administered (WHO 2022). Therefore, the Saudi government responded to the threat of COVID-19 from the start by imposing lockdown to curb the number of affected patients and to prevent the fast-spreading virus, such as turning to distance learning, banning travel, imposing curfews, and postponing social activities (Alahdal, Basingab and Alotaibi 2020). As social activities and social communication were affected by the crisis, people tend to increasingly use social media platforms, one of which is Twitter.

In Saudi Arabia, Twitter is the third most popular social media after *WhatsApp* and *Instagram* reflecting contemporaneous Saudis' opinions (Global Media Insight, 2022). On Twitter, there are 25 million, accounting for 72% of the country's total social media users (Ibid). During the COVID-19 crisis, the public used Twitter to receive news, seek information, and express their feelings and attitudes towards the virus (Chan et al., 2020; Chiolero, 2020; Karmegam & Mapillairaju, 2020; Al-Shargabi & Selmi, 2021). Analysing the content of these messages would help the agencies and the officials to identify the public's needs and concerns (Thelwall & Thelwall, 2020), calm the public down, release reliable information, and plan future decisions (Lin et al., 2016; Kim, & Hastak, 2018; Lovari & Bowen, 2020).

Significant growth in literature has empirically examined public attitudes regarding COVID-19 (Karmegam & Mapillairaju, 2020; Abdelhafiz et al., 2020; Cori et al., 2021; Luo et al., 2021; El-Sayed, Lazem, & Abougabal, 2021). Findings from these studies showed that most of the participants expressed negative attitudes (Karmegam & Mapillairaju, 2020, Schoultz et al., 2023, Peiró et al., 2023) towards COVID-19 such as fear of infection (Karmegam & Mapillairaju, 2020; Imran et al., 2020; El-Sayed, Lazem, & Abougabal, 2021, Kim, Ju, & Lee, 2022; Vargas et al., 2023), fear to infect the loved ones (Kim, Ju, & Lee, 2022; Peiró et al., 2022), fear of death (Kim, Ju, & Lee, 2022), fear to take vaccine (Karlsson et al., 2021), sadness (Karmegam & Mapillairaju, 2020; Imran et al., 2020), the anger of the misinformation and rumours spread in social media (Karmegam & Mapillairaju, 2020; El-Sayed, Lazem, & Abougabal, 2021). However, other studies (Abdelhafiz et al., 2020; Almaghrabi, 2021; Fawzy & AlSadrah, 2022) showed participants' positive attitudes towards public awareness and good practices to the protective measures to mitigate the transmission of COVID-19 recommended by healthcare policies such as staying at home, limiting personal contact, wearing a face mask, and washing hands.

Based on prior literature, two concluding remarks have to be mentioned here. First, the majority of the previous studies that investigated public attitudes regarding COVID-19 were quantitative (Abolfotouh et al., 2020; Abdelhafiz et al., 2020; Al-Hanawi, 2020; Li et al., 2020; Abdelhafiz et al., 2020; Cori et al., 2021; bolfotouh et al., 2021; Meo et al., 2022, Vargas, et al., 2023), some were qualitative (Karmegam & Mapillairaju, 2020; El-Sayed, Lazem, & Abougabal, 2021) while in other studies, the researchers adopted mixed methods (Luo et al., 2021). Second, little is known about the Saudis' reactions on Twitter during COVID-19 and after. Therefore, the present study will contribute to the literature by filling the existing gap. The study aims to investigate how Saudi Twitter users express their feelings qualitatively during and after a pandemic.

2. Methodology

2.1. Data collection

For the scope of this study, Arabic tweets related to COVID-19 expressed by Saudi citizens were collected from Twitter using the web scraping service Apify (Apify, 2022). Apify is a versatile software platform that enables users to develop a custom Twitter Application Programming Interface (API). Such an API platform facilitates the extraction of a wide range of valuable information from Twitter, including tweets, retweets, favorites, replies, and threads, as well as comprehensive user profiles that provide details on biographies, locations, and follower/following counts. The Apify scraper was selected for the following reasons: (1) easy to use, (2) free of charge, (3) fast in downloading and organizing the data, (4) does not require a Twitter account, (Zarco & Cordón, 2020), and (5) supports the Arabic language.

To ensure a high-quality dataset for labelling, only original Arabic tweets that pertained to the personal experiences of Saudis during and after the global pandemic were included. To achieve this, a set of manual filtering criteria were applied to exclude the following types of tweets: (1) promotional or advertising posts, (2) tweets from users residing outside Saudi Arabia, (3) tweets containing Uniform Resource Locators, (URLs), numbers, or emojis, (4) retweets or copies of tweets, (5) vague and brief tweets, (6) non-Arabic words or phrases, and (7) tweets containing harsh language.

The data covered the period of COVID-19 from the 1st of January 2020 to the 7th of July 2022. The reason for selecting these dates is that they include the public's opinions and reactions during and after the spread of the pandemic in Saudi Arabia. The selection of these tweets was primarily based on trending hashtags and keywords populated from Saudi Arabia (see Table 1). A total of 11,900 Arabic tweets were obtained, and only 473 tweets were considered in this study (see Figure. 1).

Hashtag	English Translation	Hashtag	English Translation
#إيقاف_صلاة_الجماعة	Stopping congregational prayer	#المسافة_ما_تفرقنا	Distance does not separate us
#إغلاق_الحدائق	Closure of parks	#نتفرق_لصحتنا	Let us separate for our health
#صلوا_في_رحالكم	Pray at your houses	#احنا_قدها	We can do it
#ايقاف_الصلاة_بالمسجد	Stopping prayer at the mosque	#سحابة_وتعدي	The clouds will clear
#ايقاف_صلاة_الجمعة_والجماعة	Stopping Friday and congregational prayers	#يارب_ارفع_عنا_البلاء	O Allah! Lift away this scourge
#إغلاق_محلات_الحلاقة	Closure of barbershops	#مبادرة_أنتم_أبطال	You Are Heroes initiative
#اغلاق_المقاهي	Closure of cafes	#تجارنا_فيهم_الخير	Our merchants have goodness in them
#اغلاق_الصالونات	Closure of salons	#ابطال_الصحة_بكم_نفخر	Health heroes we proudly salute you
#ايقاف_الدوري	Stopping football league	#اسبوعين_فقط	Two weeks only
#تعليق_النشاط_الرياضي	Suspending sports	#تمرينك_ببيتك	Exercise at home
#تعليق_الرحلات_الدوليه	Suspending international flights	#بيتك_ناديك	Your home is your gym
#تعليق_الرحلات_الداخليه	Suspending domestic flights	#بتمرن_بالبيت	I will exercise at home
#تعليق_العمل	Suspending work	#اجلس_بالبيت	Stay at home
#تعليق_الدراسة	Suspending school	#قهوتك_في_بيتك	Your coffee at your home
#اغلاق_النوادي_الرياضية	The closing of sports clubs	# نبيها_صفر	We want it zero
#إغلاق_المجمعات_التجارية	Closure of shopping malls	#المملكة_تستاهل_أكثر	The kingdom deserves more
#تعليق_القطاع_الخاص	Suspending private sector	#كلنا_مسؤول_عن_الوطن	We are all responsible for our country
#منع_التجول	Curfew	#لبيه_ياوطن	Here to help my home
#منع_التنقل_بين_المناطق	Ban travel between regions	#اكثر_شي_سويته_بالحجر_المنزلي	What I mostly did during quarantine
#حظر_كامل	Curfew	#الحجر_المنزلي_واجب_وطني	Quarantine is a national duty
#كلنا_بالبيت_لاجل_السعودية	Staying at our homes for Saudi Arabia	#استراحتي_في_بيتي	Resting at my home
#حظر_التجول_الكامل	Curfew	#نشاطي_في_منزلي	My activity at my house
#حجر_كامل	Quarantine	#فعاليات_الحجر_الصحي	Quarantine activities
#قاعد_بالبيت	Staying home	#الحجر_المنزلي	Quarantine
#خلك_بالبيت	Stay at home	#إلزم_بيتك_حماية_لك_ولمجتمعك	Stay home to protect youself and your community
#خلك_في_البيت	Stay at home	#اعزل_نفسك	Isolate yourself
#حظر_التجول_في_السعودية	Curfew in Saudi Arabia	#وضعنا_مع_الحجر	Our situation with quarantine

Table 1: Sample of hashtags used to collect the dataset

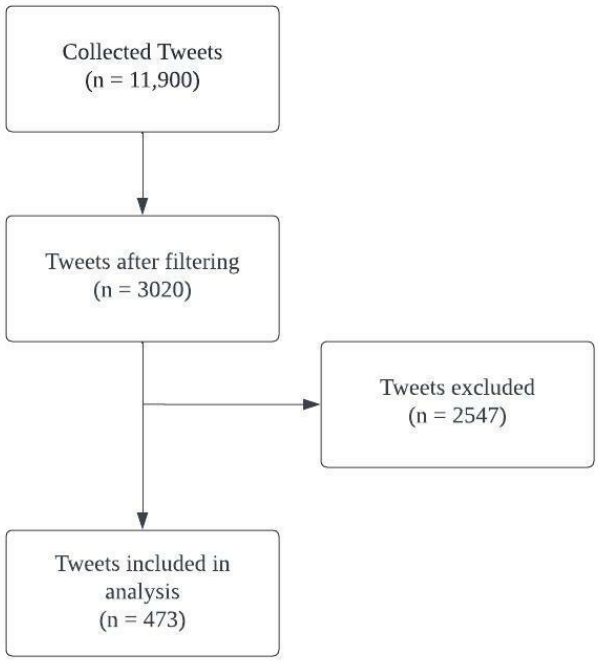

Figure 1: Flowchart (adapted from Selman et al., 2021)

For ethical consideration, example tweets used in the results were carefully paraphrased to maintain the Twitter users' anonymity and confidentiality (Ahmed, Bath, & Demartini, 2017) as those users may not be aware that their posts might be used for academic research (Zimmer & Proferes, 2014).

2.2. Data analysis

As the datasets were downloaded from Apify, opened in Microsoft Excel, and filtered out, the data were ready to be analysed. A qualitative thematic analysis was used (Braun & Clarke, 2006) as a framework of analysis to understand the Saudis' experiences and perceptions during the outbreak of COVID-19 and after. The six steps of thematic analysis adapted by Braun & Clarke (2006) were employed. These steps included: (1) becoming familiar with the data by reading and understanding the data, (2) generating initial codes by creating labels for the different parts of the text to help in identifying key themes and sub-themes, (3) finding themes based on codes by grouping similar codes together to generate themes, (4) reviewing themes, and lastly (5) defining themes. Therefore, Saudis' tweets were read several times by both authors independently and then together to compare the codes and discuss the differences in coding. Moreover, to assess the reliability of coding, an independent coder with an academic background in thematic analysis was invited to code the collected data. Subsequently, codes were compared and grouped together until an agreement for the final emergent themes was met.

Sorting and grouping the data into themes were done by using three-column tables (see Table 2). The first column includes the year of posting the tweet. The second column involves the main theme (or sub-theme) with examples from Arabic tweets that were modified and translated into English to protect the Twitter user's identity. Lastly, the third column displays the number of each tweet as it is classified under its appropriate theme or sub-theme.

Year of posting tweet	Main theme (or sub-theme) **Fear** Sub-theme: Fear of being infected	Tweet No.
2022	*Up till now, if someone coughs beside me, I will be worried*	1

Table 2: Sample of organizing datasets into themes

It is important to note that throughout the results section, frequencies were applied to the themes and sub-themes to identify the most significant issues for Saudis users during and after the pandemic. In presenting tweet examples for each theme, the Arabic tweets were paraphrased and translated into English, followed by the tweet's number as it appeared in the three-column tables above, as well as the year of posting the tweet. For example,

Up till now, if someone coughs beside me, I will be worried (T1, 2022)

3. Thematic Analysis Results

Five main themes were generated from the data: 1) negative experiences; 2) positive experiences; 3) advice-giving; 4) humour; and 5) seeking-information. These themes are presented in Figure 2 with numerical counts resulting from our thematic analysis.

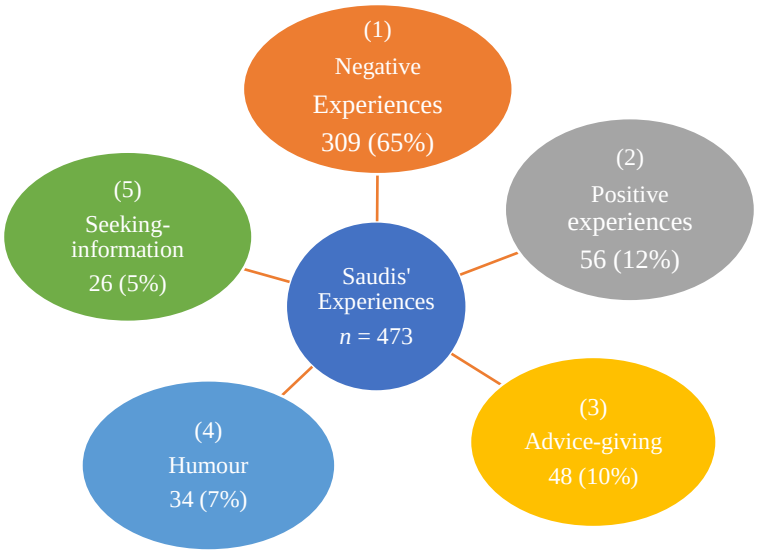

Figure 2. Saudis' experiences during and after the pandemic

Table 2 below summarizes the relative frequency of themes and sub-themes in the dataset of Saudis' tweets. These themes are displayed of descending importance to the Saudis, as illustrated below.

Collected tweets: (*n* = 473)		
Themes	**Sub-themes**	**Frequency**
1. Negative experiences	Fear, Frustration, & Sadness	309 (65%)
a. Fear 205, (66%)	to be infected	121 (59%)
	to take the vaccine	37 (18%)
	to infect others	31 (15%)
	to die	16 (7 %)
b. frustration 56, (18%)	Quarantine & Pain & corona symptoms	56 (18%)
c. Sadness 48, (15%)	unable to pray at mosques	30 (62%)
	To lose beloved ones	18 (37%)
2. Positive attitudes		56 (12%)
3. Advice -giving		48 (10 %)
4. Humour		34 (7%)
5. Seeking-information		26 (5%)

Table 2: Thematic analysis –Themes, sub-themes and frequency

3.1. Negative experiences

The predominant theme that emerged from the data was negative (309, 65%) with the overall experience. Saudi users expressed negative emotions of fear, frustration and sadness towards the pandemic. Each sub-theme is explained below.

3.1.1. Fear

Fear was frequently revealed in the Saudis' tweets (205, 66%) by expressing their fear of being infected (121, 59%), to take vaccine (37, 18%), to infect others (31, 15%), and to die (16, 7 %).

3.1.1.1. Fear of being infected

The majority of users (121, 59%) described their fear and anxiety if they experienced symptoms of the coronavirus or were in close proximity to someone who was coughing or displaying symptoms of the virus, as exemplified in the following example.

> *Oh God! Could you imagine we went to the hospital and entered a department that was a Corona Department? When a lady coughed, I became extremely anxious. I asked the nurse: What department is this? She replied this is the Corona Department. My face turned blue!! (T100, 2021)*

At the same time, other users reported their fear if they themselves cough so other people would think they had corona, as exemplified in the following tweet.

> *Yesterday I had a cough in the class, and I was about to die as I did not let it go out. I was afraid that the world would think I had Corona. (T53, 2021)*

3.1.1.2. Fear of taking the vaccine

Fear is also associated with users' hesitancy to take the vaccine. Saudi users (37, 18%) expressed their fear and hesitancy to take the vaccine because of its negative side effects (i.e., high fever, sore arm, fatigue, loss of smell and loss of taste), as exemplified in the following tweet:

> *I booked an appointment and did not go. I was afraid of the vaccine's side effects because the second dose was stronger than Corona. (T10, 2022)*

3.1.1.3. Fear of infecting others

A proportion of Saudi users (31, 15%) who had been exposed to the coronavirus articulated their concerns regarding the possible transmission of the infection to their family members or acquaintances, either directly from them or from an external source. This viewpoint is illustrated in the following quote:

> *I was the first one who got corona. I was so careful because of my mom. When I got it, I became so afraid for her. I swear to God, when I received a message saying that my mom tested positive, I was about to die. We did not tell her. Thank God everything passed, and she is fine. (T131, 2021)*

Others reported their worries if they lose their beloved ones, as shown in the following tweet:

> *When my dad and I got infected, I was too anxious to lose my dad and my mom in a month. (T155, 2020)*

3.1.1.4. Fear to die

Some users (16, 7 %) described their fear if they die because of getting the infection, as reported in the following tweet:

> *I am afraid to book an appointment because I have contacted and I am afraid that I got the virus and would die. (T77, 2021)*

Others described how their family members reacted once they heard they tested positive and thought that s/he would die.

> *When I got Corona, many people asked me to forgive them. My sister, as well, asked me if I needed anything, as if she wanted me to write my will. They thought I was going to die. So, I got anxious, and I started to say to myself I am definitely going to die!! Thus, I switched my mobile off for 12 days. After that, when I switched my mobile on, I*

found a voice message from my friend, she was crying as she thought I died. That was the longest period I was away from people. (T160, 2021)

3.1.2. Frustration

The language of frustration and anger is clearly shown in all tweets. Saudi users 56 (18%) expressed their frustration during the quarantine as well as the pain of symptoms they had when they got the virus infection. They also expressed their anger as this illness has not vanished, as presented in the following tweet:

What a cursed corona it is! The cough weakens me, and I am about to die from it. Every time I say I will be fine, and I will go out and celebrate the Foundation Day. The problem is that this hated pandemic does not disappear. (T226, 2022)

3.1.3. Sadness

3.1.3.1. Sadness of banning prayers

Banning prayers or group prayers in mosques during the lockdown in Saudi Arabia was sensed as painful in some Saudi tweets (30, 62%), especially for adult males who were used to praying five daily prayers in the mosques as presented below:

My father went out to search for a mosque to pray the Fajr prayer. He did not believe us when we informed him about the decision of banning prayers at mosques. He is a 60-year-old, and this is the first time he prayed Fajr prayer at home. So, he prayed, and he was crying. May Allah remove the epidemic and bring down His mercy and kindness to His servants. (T468, 2020)

3.1.3.2. Sadness of losing family

The tone of Sadness was clearly depicted in Saudis' tweets (18, 37%) when losing a family member. In some texts, Saudis shared their sadness about a family member dying alone in a hospital because of COVID-19 without having a close relative or a familiar person present due to the control restrictions, as shown in the following tweets:

My father had a strong character and did not fear anything. In the last days of his illness, he was afraid to be alone. Even when he was sleeping, someone had to sleep with him every day. We did not leave him alone. He used to say, "I am not afraid of anything but to die alone and not have anyone besides me". He was admitted to the hospital during the peak of corona, and one of the restrictions was not allowing a companion with the patient. He died alone. Whenever I remembered this situation, my heart breaks. (T323, 2022)

3.2. Positive attitudes

In some tweets, Saudis (56, 12%) expressed their positive attitudes toward the public for their adherence to preventive care to stop spreading the disease, such as getting vaccinated, wearing face-covering, keeping a safe distance and staying at home as clearly presented in the following tweet:

Thank God, from the beginning of corona, my sister and I got infected by Corona only once. Thank God, up to now, we have not been infected again because we are taking (good) care of preventive measures such as keeping a safe distance, wearing face-covering, and sanitizing. (T411, 2021)

3.3. Advice-giving

Advice-giving is clearly presented in some of the Saudis' tweets (48, 10 %). Saudi users shared their experiences with corona infection, the symptoms they had, the effective herbal medicine they made, and the disappearance of the illness to lessen and elevate others' pain and to support them emotionally, as illustrated in the following tweet:

I am telling from my personal experience: when I got corona, I was dying from the cough. I could not sleep. Honey relieved it a lot, thank God. And by the way, chocolate irritates it. Take honey on an empty stomach. (T277, 2022)

Here is another piece of advice from another Twitter user:

I got corona, and I had dyspnea. I treated myself by using guava leaves. If I drink it, it relieves dyspnea. I put a few leaves in a cup, pour hot water on it and drink it as tea. (T282, 2022)

3.4. Humour

Humour is depicted in some of the Saudis' tweets (34, 7 %), in which they tended to narrate the funny stories that happened to them during COVID-19, as clearly shown in the following tweet:

> *I used to pick up any man who needed a ride, but after corona spread, I became afraid. Anyways, two days ago, a man waved his hands to me, and it was clear that he knew me. When I came closer, it was Abu Mohammad, an annoying man who I used to take from time to time. I was embarrassed to ignore him. So, I decided to find an excuse. I opened the front car's window, and I said: "Abu Mohammad stay away. I have corona. Do not come in"!! He laughed and got in, and said, I have corona as well". (T447, 2021)*

3.5. Seeking information

Some of the Saudis' tweets (26, 5 %) were seeking information either about the symptoms of corona or eligibility to take the vaccine, as presented in the following tweet:

> *Asslam Alukum, I have had corona since Sunday, and I got the symptoms. I do not taste anything. My test is tomorrow, but the symptoms have started to disappear. If I take the test, will the result be negative? Does anyone have any background? Because I have to stay a couple of months without a vaccine dose, and I am a university student. I must have a report about this. (T390, 2022)*

4. Discussion

The current study was conducted to explore the Saudis' personal attitudes on Twitter during and post pandemic. A Thematic analysis framework was adopted to analyse the collected data and to address the gap in the literature (Fawzy & Alsadrah, 2022). Although the thematic analysis framework has been limited in previous studies, it has been encouraged to determine the needs and concerns of those who are under the duress of an impending crisis (Lachlan, Spence, & Lin, 2014; Lipsitch, Swerdlow, & Finelli, 2020).

A thematic analysis of Saudis' tweets resulted in the identification of five main themes (see Figure 2). The findings yielded from this study showed that negative attitudes (i.e., fear, frustration, and sadness, 309, 65%) are predominantly prevalent among the Saudis. Saudis expressed their fear if they get the infection 121 (59%), taking the vaccine 37 (18%), infecting others 31(15%), and dying 16 (7%). Also, Saudis users 56 (18%) expressed their frustration during the quarantine and the pain they got when they were infected. In addition, some expressed their sadness 48 (15%) when they were banned from praying at mosques 30 (62%), and when they lost their beloved ones 18 (37%). Our results support previous findings (Karmegam & Mapillairaju, 2020; Imran et al., 2020, El-Sayed, Lazem, & Abougabal, 2021; Al Ghafri et al., 2020) that negative emotions, especially fear (Karmegam & Mapillairaju, 2020), are most prominent themes among people who shared bad images, videos, and personal opinions towards COVID-19. Such excessive negative emotions can affect mental health, leading to anxiety and depression (Vargas et al., 2023). These findings suggest that Saudi governmental agencies should take the initiative by posting positive news on social media platforms.

Findings from our study showed that Saudi Twitter users (56, 12%) demonstrated positive attitudes towards the preventive measures to minimize the spread of COVID-19, such as wearing face masks, washing hands, and staying home. They believed that implementing these measures was essential to protect themselves against COVID-19. This attitude is in line with findings from previous research (Abdelhafiz et al., 2020; Li et al., 2020; Meo et al., 2022). The majority of the respondents in Meo's study (2022) showed optimistic attitudes towards public health measures, which play an important role in combating infectious diseases. The findings suggest that the public's adherence to stringent COVID-19 policies could help in limiting the virus and enhance compliance with the Saudi governmental directives during COVID-19.

With regard to the third theme extracted from the Saudis' tweets, it has been shown that Saudi users shared their personal advice (48, 10%) concerning the herbal medicine they made when they got the corona infection. This finding is similar to those of other studies (Alyami et al., 2020; Huang et al., 2020; Lam et al., 2021; Özlü et al., 2022) in which the public tends to resort to herbal medicine as a self-care precaution to reduce the potential symptoms of COVID-19. It can be claimed that people use such natural herbs because they are associated with family traditions (Welz, Emberger-Klein, & Menrad, 2018). Moreover, herbal remedies are safe, accessible, cheap and easy to prepare (Özlü et al., 2022).

Findings showed that a few Saudi users (34,7%) resorted to humour or corona jokes during times of crisis to demonstrate their fear of getting the virus. The findings of this study are similar to those obtained by Karmegam and Mapillairaju (2020), in which the theme of humour appeared in the lowest count, but they differ from the purpose of the humorous tweets. Most of the

humorous tweets in Karmegam and Mapillairaju's (2020) study were about the outbreak of COVID-19, whereas in our study, they were about the fear of the disease itself. It could be that the aims of both studies are different; Karmegam and Mapillairaju's (2020) study investigated public opinions in English on Twitter in general during the COVID-19 pandemic, whereas ours explored specifically the Saudis' tweets during and after the pandemic. The findings of this study suggested that although joke messages and stories reduce negative feelings (Hussein & Aljamili, 2020; Strick, 2021), Saudis still have a fear of getting the virus. This means that they need positive news from the Ministry of Health that alleviate their fears and ensures them that the virus appears to be under control and that the confirmed infected cases are decreasing.

Our findings also showed that in some tweets (26, 5%), Saudis sought online information either about corona symptoms or eligibility to take the vaccine. This finding is consistent with the findings of the previous studies (Bento et al., 2020; Karmegam & Mapillairaju, 2020; Khosrowjerdi, Fylking, & Zeraatkar, 2023) in which the public sought information regarding the COVID-19 outbreak, including the virus, symptoms, prevention, treatment, and confirmed cases. Our results have practical implications for health authorities and Saudi citizens. The Ministry of Health could launch online information services to respond to the citizens' enquires and guide them in implementing necessary actions to avoid risks. In other words, the government and health authorities could create a web page that addresses the most recurring questions from citizens during the pandemic, followed by the authorities' answers. Such web pages should be updated regularly and, consequently, serve as a reliable source of information for citizens rather than following misinformation and fake news that could have negative consequences. In this way, the government and Health authorities may counter untrusted information and fake beliefs (Hafidz et al., 2023). Furthermore, our findings suggest that Saudi citizens should search for basic information from authentic sources to learn more about the virus and its impacts.

5. Conclusion

The current study was conducted to understand the Saudis' perceptions of Twitter during and post the outbreak of COVID-19. Understanding Saudis' opinions encourages government agencies to actively engage in two-way communication with the public, provide trustworthy information, and manage the crisis based on the public's needs (Lin et al., 2016, Karmegam & Mapillairaju, 2020). A thematic analysis of Saudis' tweets resulted in the identification of five overarching themes:1) negative experiences; 2) positive experiences; 3) advice-giving; 4) humour; and 5) seeking-information. Negative experiences (i.e., fear, frustration, and sadness) were predominantly prevalent among the Saudis.

The present study has limitations that provide suggestions for future studies. A small dataset size (473 tweets) was collected within a one-week duration. Twitter was used as the source of information. Only original Arabic tweets related to Saudi Twitter users' perspectives during and after the outbreak were included to obtain reliable results. Thematic analysis was used as a qualitative methodology to analyse the data. Therefore, conducting quantitative research with a larger data set across various social media platforms (such as Facebook, Instagram, WhatsApp, and YouTube comments) with other languages is needed to reveal additional and comparative insights. Furthermore, it might be helpful to assess the correlation between the results extracted from tweets and those found on other online platforms.

Despite the limitations mentioned previously, the current study contributes to the existing literature and hopefully fills the research gap of the Saudis' perspectives during and post COVID-19 by extracting important themes that emerged from the tweets data. Our present research has shown that Twitter is a valuable source of reality (Letierce et al., 2010), reflecting unique experiences among its users. Thematic analysis has proven to be a useful approach in providing insightful information about the Saudis' needs in times of crisis and after. In addition, governments and health authorities can have a better understanding of the public's needs and thus prepare their crisis management strategies in order to relieve the public's psychological pressures.

In summary, the World Health Organization (2023) announced - on Friday, the 5th of May 2023 - that COVID-19 is no longer a public health emergency of international concern, and countries have to transit from emergency mode to managing COVID-19 alongside any other infectious diseases (Lenharo, 2023). This indicates that countries worldwide have gained valuable knowledge about crisis management strategies during the pandemic and after. Moreover, the general public across the globe has also learned important lessons from the COVID-19 crisis, as exemplified in the following tweet from our data:

> *The Corona crisis will remain a memory from which we learned a lot, and we will narrate it to our children and grandchildren* (T427, 2022).

Acknowledgements: The authors would like to thank Mrs. Hawazen Al-Quthami for revising the English translation.
ORCID ID: Dr. Maha A. Alayyash https://orcid.org/0000-0002-0809-8028
Raghad N. Althobaiti https://orcid.org/0009-0003-1294-165X
Funding: This research received no external funding.
Conflicts of Interest: The authors declare no conflict of interest.
Publisher's Note: All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers.

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