COVID vaccine and generation Z – a study of factors influencing adoption

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Abstract

Purpose – *The purpose of this paper is to identify the factors that affect Generation Z behavior in the adoption of the COVID-19 Vaccine.*

Design/methodology/approach – *Qualitative data was collected using 30 in-depth interviews from University students, using purposive sampling and the data was subjected to thematic analysis. The interview was done through the Zoom application.*

Findings – *The results reveal that the key variables that expedite the adoption process among Generation Z is Observability, Country of Origin, Brand and Word of mouth. Observability is the most influential variable, followed by word of mouth in the adoption of the vaccine. This study holds much importance to the marketers, to come up with carefully orchestrated campaigns to demonstrate the success of the vaccine, which could influence a faster rate of adoption.*

Research limitations/implications – *The research is limited to University students who belong to Generation Z, the studies on other demographic groups could reveal other interesting insights. A quantitative study examining the relationship of the adoption and other variables will conform to the results of the study.*

Practical implications – *The study will allow marketers to come up with effective promotion strategies to encourage the adoption of the COVID 19 vaccine. The emphasis should be given to triggering word of mouth and improving the observability of the effectiveness of the vaccine.*

Social implications – *The strategies to encourage the adoption of the vaccine could result in reducing the effects of pandemics and further spread of the virus.*

Originality/value – *This study holds much importance to the marketers to come up with carefully orchestrated campaigns to demonstrate the success of the vaccine, which could influence a faster rate of adoption. The study also contributes to the consumer behavior literature by addressing the existing research gap.*

Keywords *Country of origin, Brand, Word of mouth, Generation Z, COVID 19*

Paper type *Research paper*

1. Introduction

Coronavirus (COVID-19) has affected the entire world, and the resulting economic crisis will likely be the deepest in modern history (Morsy *et al.*, 2020). Over a million deaths were reported and 35 million people have contracted the virus (World meter, 2020). The numbers are climbing by the day and the only solution seems to be a vaccine that could effectively combat this virus. However, this can only happen if new ideas and product messages spread faster than the virus (Gladwell, 2002). The new vaccines have to be effective and popular among the stakeholders. At present, 23 companies, including Glaxo, Pfizer and Johnson and Johnson, are in different stages of developing a COVID-19 vaccine (Lee, 2020). The focus of the world is developing a vaccine, representing the supply side of the equation.

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Meanwhile, not enough questions are being asked from the demand side (Su *et al.*, 2020). An understanding of the factors that could affect the adoption of the vaccines is critical in devising strategies that encourage people to accept the vaccine. The results of a recent

study done by the Associated Press and the University of Chicago reveals that COVID-19 vaccine availability does not alone convert into vaccine adoption (The Associated Press, 2020). Another similar study done in France suggests that 26% of the people surveyed indicated they would refuse a COVID-19 vaccine once it becomes available, and the non-adoption rate among low social-economic class people is even more, higher at 37% (Simpson *et al.*, 2020).

Innovations are associated with novel ideas, practices or objects that adopters embrace, although these could result in uncertainties (Rogers, 2003). These uncertainties could pose challenges in accepting a new product. For example, due to the perceived risk and the nature of the products themselves, health-care products are traditionally less likely to be accepted faster. Social pressure and effective communication highlight the significance of the product with people to gain insights into their reasons for adoption, such as the desirable attributes of the innovation, leading to faster adoption (Dearing, 2008; 2002, 2003). As they consider novel ideas attractive, innovators are the first to adopt and overcome the risk of uncertainties. In the case of the COVID-19 vaccine, the innovators would be frontline workers in the fight against the pandemic, including the medical doctors and other medical staff.

The current research set out to identify the factors that could affect Diffusion of Innovation (DOI) among Generation Z in the case of the COVID-19 vaccine. Generation Z is estimated to encompass more than two billion young people and represent around 32% of the global population (Miller and Lu, 2018). A study done in the US on Generation Z reveals that younger Americans, compared to other generations, view the COVID-19 as stress-inducing and a more significant threat to their personal finances (Schaeffer and Lee, 2020). Often, members of this generation are risk-averse early adopters for many product categories and can easily exert more influence on others. As they are socially active, the chances of them contracting the virus will be more. Though this generation is expected to have high immunity, they could be the carrier of this virus. This could be detrimental as they could spread the virus, particularly to the older people who are more vulnerable to the virus attacks in their reference group. Another study on Generation Z found out that they significantly influence family decision-making related to products of all categories, including personal care (IBM, 2017). Generation Z could play an influential role in schools, universities and their own families, triggering the adoption process. Thus, research that uncovers the attributes that could influence Generation Z in the adoption of the COVID-19 vaccine could contribute to designing effective promotional campaigns to expedite the DOI process. Getting this generation vaccinated could result in a reduction of the spread of the virus.

In the literature, DOI is a widely researched concept and the theory proposed by Rogers (1961, 1983, 1995, 2003) is one of the widely accepted and cited theories. Though several minor mutations of this theory have emerged, the factors of diffusion that have been previously identified remain valid. Of late, there has been a growing emphasis on predictive studies in which scholars use DOI in increasing the number of adoptions (Dearing, 2008). Some recent studies on the effect of COVID 19 were done by researchers in different domains, notably Song (2020) on psychological stress, Morsy *et al.* (2020) on opportunities on food trade and Janssens *et al.* (2020) on short term economic effects of households. However, no study has tried to examine Generation Z's behaviors in terms of their adoption of the COVID-19 vaccine in the context of the DOI process.

Further research is required to investigate whether people talk about innovation in science and what they decide to share and what their listeners hear (SouthWell, 2017). Though some research progress is made in understanding Generation Z's attributes, very little is known in the context of the United Arab Emirates (UAE), where a total of 1.4 million individuals who are part of this generation are located (Ameen and Anand, 2020). Therefore, the current study seeks to gain insight into the underlying factors that could

influence the adoption process of the COVID-19 vaccine among Generation Z in the UAE. More specifically, the study addresses the following research questions:

RQ1. What are the factors that could influence the adoption of the COVID-19 vaccine among Generation Z?

RQ2. What is the influence of the brand on Generation Z in the case of COVID-19 vaccine adoption?

RQ3. Does the country of origin play an influential role in adopting the vaccine?

RQ4. Which attribute of innovation has a profound effect on vaccine adoption among Generation Z and why?

2. Literature review

DOI is a widely researched subject field, which can be traced back to the seminal work of Ryan and Gross (1943). The next few decades witnessed various studies relating to DOI conducted in different contexts and disciplines. The studies mainly investigated how individual, societal, cultural, economic and technological factors influenced the speed and character of diffusion (Ryan and Gross, 1943; Beal and Bohlen, 1955; Coleman *et al.*, 1966; Valente and Davis, 1999). A school of thought that clearly stands out among the DOI literature is Rogers' theory, which is the most cited theory in the DOI literature (Fry *et al.*, 2018). The simplistic and pragmatic nature of the study, which could be examined across different disciplines, could be one of the contributing factors why this is still the most widely used DOI framework in the literature (Fry *et al.*, 2018). Rogers's (2003) DOI theory has been widely applied in such disciplines as education, sociology, agriculture, marketing and information technology. Hence, Rogers' DOI theory is the most appropriate for the current study. In his innovation diffusion model, Rogers (1962) describes diffusion as a particular type of communication that includes innovation, communication, time and social systems (Rogers, 1983). The messages of innovation are communicated through various channels and those who adopt the product in the early stages could serve as opinion leaders, change agents and champions (Lundblad, 2003). Communication channels, such as mass media, could play an essential role in the spread of innovation; meanwhile, interpersonal networks are helpful in forming attitudes about the new product (Rogers, 2003).

Rogers (2003) argues that opinion leaders tend to adopt innovations before others, although they are not the most innovative ones. However, in the case of several health interventions, opinion leaders in a community of medical practitioners or members of the public were identified and then innovations were introduced through these opinion leaders, thus speeding up the diffusion process (Farquahar *et al.*, 1990; Puska *et al.*, 1986). In the case of the COVID-19 vaccine, the opinion leaders would be the frontline workers. Similarly, given that early adopters are a category of people who are risk-averse, members of Generation Z could be considered early adopters in the DOI of the COVID-19 vaccine. This group could play a critical role in expediting the acceptance of the new vaccine because they could trigger the imitative effect in society. The literature provides a lot of different attempts to define Generation Z. There are research studies that rate those who were born after 1982 as members of this generation (Howe and Strauss, 1991). However, most researchers suggest that Generation Z are born in 1995 or later (Bassiouni and Hackley, 2014; Budac and Baltador, 2014; Cillers, 2017). Seemiller and Grace (2016) are more precise in their definition; they call them "post-millennials" and classify them as the people born between 1995 and 2010. Despite the varying beliefs regarding the classification, the consensus is that members of this generation cohort have now moved to college and are known as young adults (Nguyen *et al.*, 2018). The current study is focused on University students who are born after 1995.

Rogers (1983) identified five critical factors that could influence the adoption of an innovation, namely, relative advantage, compatibility, complexity, trialability and observability. Relative advantage is the degree to which an innovation is considered better or superior to its predecessors. The COVID-19 vaccine is expected to have a high degree of relative advantage, as there are no substitute products available to counter the virus. The greater the relative superiority felt by adopters, the faster the innovation can be adopted. This aspect could influence the faster adoption rate of the vaccine. Compatibility is the degree to which the innovation is considered consistent with applicable values, experience and adopters' needs. If a particular innovation or new idea does not match the prevailing values and norms, then the innovation cannot be adopted quickly, as is the case with compatible innovations. Complexity refers to the degree to which innovation is considered difficult to understand and use. Some innovations are easily understood and used by adopters, while others are the opposite. The more easily understood by adopters, the faster an innovation can be adopted. The COVID-19 vaccine could be categorized as being highly complex due to the limited information on the research and the nature of the product. The ability (trialability) to be tested is the degree to which an innovation can be tested to a certain extent. An innovation that can be tested in actual settings will generally be adopted more quickly. Thus, to be quickly adopted, innovation should be able to demonstrate its superiority.

The ability to be observed (observability) is the degree to which the results of innovation can be seen by others. This could be one of the critical variables in the case of the COVID-19 vaccine that is if a group who has been vaccinated could demonstrate that they are now immune to the virus, then this could affect the adoption process of other groups. This is where the communication aspect of innovation is critical. Thus, it can be concluded that the smaller the complexity and the greater the relative superiority, suitability and abilities to be tested and observed, the faster the possibility of innovation adoption. In a sense, communicating the superiority and observability factors to early adopters is considered a propitious factor that could impact faster diffusion.

2.1 Generation Z as opinion leaders

Opinion leaders and early adopters could play an influential role in the DOI process. In the context of the current study, the opinion leaders are the health workers in the fight against COVID-19; they will be the innovators. The early adopters could play a potential role of being opinion leaders if they could be convinced to adopt the vaccine. Pharmaceutical companies are the innovation source or the sponsor; they should focus on convincing a small set of possible adopters (Castro *et al.*, 1995; Puska *et al.*, 1986). Generation Z, with their traits mentioned previously, could fall into the early adopter category. This group has the potential to be the opinion leaders, along with the frontline workers and could play an influential role among the early and the late majorities. The proximity of the opinion leaders to a different group of people can help spread or diffuse innovation (Coleman *et al.*, 1966; Feder and Savastano, 2004; Greer, 1988). They could play an influential role among the groups that they associate with (Hiss *et al.*, 1978; Weimann, 1994). Thus, the challenge here is to identify the underlying motives, perceptions and awareness that this group has in relation to the COVID-19 vaccine. Such information could be critical in developing effective communication strategies. The study is done in the UAE among members of Generation Z to uncover their attitudes toward the new vaccine.

3. United Arab Emirates and COVID-19

Several factors that are congenial to vaccine adoption make UAE a suitable nation in which to conduct a study on the adoption of the COVID-19 vaccine. The UAE is the most prosperous country in the Arab world, and its residents have had the most remarkable improvement in living standards anywhere in the world over the past decade (Kassem, 2017). The country has a robust health system in both the private and public sectors.

Renowned health service providers, such as John Hopkins and Cleveland Clinic, operate in the country. UAE has been at the forefront of fighting the pandemic and the country has taken some drastic measures, including lockdowns, cancellation of travels and even the imposition of restrictions among people traveling across the emirates. The government has also been encouraging clinical trials of the vaccines from Russia, China and Oxford. Thus far, a total of 31,000 volunteers of 125 nationalities participated in the clinical trials held in the UAE, according to a government official during a recent press conference, which included the Health Minister of the UAE (Serrieh, 2020).

The country has also initiated the prevention stage in the fight against the virus by introducing the vaccine to frontline workers. Frontline workers in the UAE include medical and non-medical staff in health-care facilities, such as those who are working in fields such as crisis management, security and emergency services, sterilization and volunteering. This group could be considered as the opinion leaders; the country is encouraging more trials of the vaccine by providing benefits for the people who choose to get vaccinated. In particular, frontline workers in the UAE will be able to visit Qasr Al Hosn and Louvre Abu Dhabi free of charge, along with three other companions, the offer being valid for a period of six months (Zaman, 2020). Offers like this could trigger more adoption, particularly among Generation Z. Thus, the focus of the study will be on a specific Gen Z group from the UAE.

4. Methodology

The study's exploratory nature warrants a qualitative methodology in the form of in-depth, semi-structured interviews (Eisenhardt, 1989; Miles and Huberman, 1984). It is expected that the one-to-one interview would ensure confidentiality, help establish equal status among participants and enable them to freely express their opinions (Burns, 2000). This is important for the study, as it sets to uncover the underlying motives that impact the adoption of the new vaccine. The current pandemic has created challenges and opportunities for qualitative researchers (Lobe *et al.*, 2020). The current restrictions, including lockdowns and social distancing, have forced the transition from face-to-face to other forms of data collection, such as phone or internet-based methods (Teti *et al.*, 2020). The internet-based data collection provides more flexibility with respect to time and location (Cater, 2011; Jankowski *et al.*, 2005). More importantly, it conforms to health and safety regulations (Lobe *et al.*, 2020), thereby creating a healthy environment, as the respondents no longer need to worry about the health-related risks that could be present in face-to-face interviews. This could also evoke a more socialized form of interaction (Johnson, 2005). The respondents in the current study belonged to Generation Z and were expected to be comfortable with the technology; in fact, they preferred online applications to convey their thoughts.

The interviews were done through the Zoom application and all the participants had previous experience in using this. This videoconferencing application has already been extensively used for research purposes (Archibald *et al.*, 2019; Daniels *et al.*, 2019; Kite and Phongsavan, 2017; Lobe, 2017; Matthews *et al.*, 2018). As the respondents were all comfortable and had fast typing skills, the response through chat was used effectively during the interviews. The recordings allowed the researchers to playback the video for further in-depth analyzes mainly related to non-verbal communication. However, for this research, as the questions were more straightforward and dealt with a topic that could be discussed openly, the respondents were quite cooperative when it came to sharing their points of view.

4.1 Sampling technique

A purposive sampling technique was adopted in accordance with the objective of the study. The main objective of purposive sampling is to produce a sample that can be logically assumed to be representative of the population. This requires expert knowledge of

the population set to select a random sample of elements that ideally represents the cross-section of that population (Lavarakas, 2008). The study targeted full-time undergraduate students enrolled in the university who belonged to Generation Z, as the participants were chosen based on their age (18–22 years old). The selection was made purposefully to yield information-rich cases (Patton, 2011). There are seven types of purposive samples, each appropriate to a different research objective. A homogeneous purposive sample is one that is selected for having a shared characteristic or set of characteristics (Crossman, 2020). As this study mainly focuses on the factors that affect DOI among Generation Z, the full-time university students who fell into this age category were deemed to be appropriate respondents.

4.2 Selection of the respondents

The sample respondents are a group of students enrolled in the Bachelor of Business program at a university-based in Abu Dhabi, the UAE. The target population was reached using the assistance of the office of student administration. The semi-structured interview questions were sent to them by email, after which the appointment for the Zoom meeting was scheduled. Purposive sampling helped achieve an equal split between genders. A total of 30 students (15 men and 15 women) were recruited and interviewed. The interviews covered a range of questions related to their beliefs and opinions about the new COVID-19 vaccine. During the interviews, the students were requested to further express their opinions using the chat function and all of them performed self-transcription while the interview was being done. The verbatim responses to the questions were stored in a Word document for each participant.

4.3 Sample size

There are no set rules for calculating the right sample size for qualitative interviews (Patton, 1990). However, compared to quantitative research methods, the sample size for qualitative methods is smaller. The nature of the qualitative methods, which are often centered around in-depth questions related to how and why a certain issue is examined, contributes to the small numbers (Dworkin, 2012). The literature is not conclusive when it comes to the ideal number of sample sizes for such endeavors. Most scholars argue that the concept of saturation is an essential factor when deciding on sample size for qualitative research (Mason, 2010). The research can be considered saturated when additional data gathered no longer produces new theoretical insights or identifies new characteristics of the core theory (Charmaz, 2006). Malterud *et al.* (2016) argued that a qualitative study needs a minimal number of participants if the study aim is narrow and if the combination of participants is specific to the aim of the study. Furthermore, the interview dialogue should be firm and grounded in established theory.

This study meets these requirements as a heterogeneous group could have similar views and could reach the saturation point with small numbers. For the current study, it was decided that 30 interviews should be conducted based on the nature of the questions, the theory being examined and the homogeneity of the sample. The interviews took place between July and August 2020. The sample size is considered sufficient for the current study and for a qualitative research study in general, as it is large enough to draw useful evidence regarding any underlying behavioral patterns and small enough to enable useful analysis (Saunders *et al.*, 2006).

4.4 Interview transcription and analysis

The current study uses the factors of diffusion from the DOI theory to analyze the responses. The research themes identified from the literature review were used to analyze and categorize the data, such as how relative advantage, trialability and observability were used

in the literature. This approach is advocated by Strauss and Corbin (1990), King (2004), Gahauri and Gronhaug (2005) and Saunders *et al.* (2006). While analyzing the data, careful consideration was given to ensure that relevant words and sentences in the interview texts aligned with a particular category (Kirk and Miller, 1986; Morgan and Hunt, 1994). Questions related to brand and country of origin were allocated to different categories. The information gathered was processed into different categories for ease of analysis (Mitic and Kapoulas, 2012). Each question was treated as a new category and the examination of answers was done for all 30 respondents simultaneously, thus facilitating the identification of differences and similarities with more precision (Priporas *et al.*, 2015).

5. Analysis and discussion

5.1 Research question 1: what are the factors that could influence the adoption of the COVID-19 vaccine among generation Z?

The students were asked about the influential factors that could affect the trial of the vaccine; 23 respondents provided clear answers, and the key factor that came out of the Interview discussion was word-of-mouth. One female respondent said, "word of mouth has a big role in affecting my decision and [those of] any other consumers because when people try something and it has a bad effect on them, they will tell other people to stay cautious." Another male respondent said:

> I think I would consider all the factors together [. . .] obviously, the side effects are important, and word-of-mouth definitely influences one's decision. Word-of-mouth is more critical because people are knowledgeable about the issue, and they give their advice based on experience with the product as well.

This was the nature of most of the responses. Generally, the respondents believed that people who received vaccination were likely to share their experiences; on further probing on this question, they said the most trusted word-of-mouth source was someone from their circle of family members and close friends who shared their positive experiences after getting vaccinated. Their experiences would have a profound effect on the respondents' decision to adopt the product. As one of the respondents said, "I would rather believe my close relative who got vaccinated than a doctor who sends out messages through social media or television."

One male respondent, however, said he would not trust word-of-mouth alone, saying that: "word-of-mouth would affect my decision, but I [still] have to do some research on the internet to check whether what people told me was right." Another respondent said price is an essential factor for her decision: "price is really important when picking which one to go for, but if the low price means that it would be a lower quality vaccine, I might not want to risk putting my body in any danger." Three respondents had the same view; they believed in the price-quality relationship and thought that a critical factor that could determine their adoption of a vaccine was high quality, as indicated through a high price.

The in-depth analysis of these statements indicated that a feeling of fear still existed among this cohort, which contributes to higher stress (Schaeffer and Lee, 2020). The fear that the vaccine could have side effects. It could be inferred that they still believed the vaccine could have some side effects regardless of its origin or brand. This might be the reason why word-of-mouth was the dominant factor that came out as the keyword. They trusted their family and friends more than others who were vaccinated and shared their experiences. To further probe into this, they were asked about what would be a reasonable time in which the vaccine would no longer have potential side effects. All of them responded by indicating short periods ranging from one week to a maximum of one month. On average, the students believed that a period of two weeks was a reasonable time to check for side effects. In short, the most influential contributing factor for adoption was a family member or friend talking about their positive experience of the vaccine after two weeks of getting vaccinated.

The analysis provided the importance of reference group influence on the adoption of the vaccine. Hence, the opinion leaders in the families could play a vital role in the adoption of the vaccine.

5.2 Research question 2 – what is the influence of brand on generation Z in the case of COVID-19 vaccine adoption?

The Likert-type questions about the brand and county of origin evoked favorable responses in terms of the Gen Z respondents' attitudes. Specific questions were asked about the brand during the interview, specifically whether it really mattered in their vaccine purchase behavior. However, the student's awareness of the vaccine brand was limited to two brands, namely, the Sputnik vaccine from Russia and the Oxford vaccine. All 30 respondents had heard about the Oxford vaccine and 21 of them knew about the Sputnik brand. None of them knew about the other vaccines, nor were they aware that companies such as Pfizer and Johnson and Johnson were developing their own vaccines. Hence, the main responses regarding brands were limited to the discussion on these two brands. The responses were mixed; the students preferred both vaccines and cited reasons for this, although the majority seemed to favor the Oxford one. Eight of them, however, said that the brand did not matter to them; rather, the results of the clinical trials could influence their decision. There were 13 responses in favor of the Oxford brand and these students believed that brand played a vital role, particularly in medicines, as they indicated quality and few side effects. As one student shared, "[The] Oxford vaccine, in my opinion, is the best in tackling COVID-19 because they have made a lot of studies to reach to this point and [are able to] release the vaccine by the end of this year." There were a couple of strong responses in favor of the Oxford brand. According to one respondent:

> I prefer the Oxford vaccine, as it is generally considered the best one, and it is also known to be reliable. Yes, brand does matter, as people mostly consider it as a belief. I would consider the brand instead of word of mouth.

Based on this reply, they considered brand as the most influential factor above word-of-mouth. Another response shed more insights into why they preferred the Oxford brand:

> In my opinion, the best vaccine to tackle COVID-19 is the one which is being developed by Oxford because it has a lot of attention and they are not in a hurry and still developing it, which will guarantee that it would be the best vaccine when it comes to the medical centers. So as I've said, I would take the Oxford vaccine, because I see that it's more helpful and they are still studying it.

It appears that the respondents believed that the quality of the vaccine was an important criterion; the underlying belief among these respondents was that a good brand would come up with a quality product. One of the strongest responses in favor of the Oxford vaccine stated that:

> In my opinion, I will be trusting the U.K. mostly, and yes, the brand and county do affect the clinical trials and the price. I feel more trust toward the U.K., because Oxford is a well-known [university] with 28 Nobel Prize winners. It is one of the best universities on the planet.

The indication here again is that students are concerned about the quality of the vaccine.

However, there were some contrasting views in favor of the Sputnik vaccine from Russia. One of them had a comprehensive response:

> I think the Sputnik vaccine is the best in tackling COVID-19, and it's the most trustworthy source. I am willing to be vaccinated, because it is already out in the public and starting human trials. This vaccine is the most publicized, and there is more information about it. It is in the fastest stage as compared to other vaccines, which are still in the developmental stage.

> The result of clinical trials is the more critical aspect in my decision-making process, as this shows how safe and reliable the vaccine will be. In these cases, price or brand does not have much importance. According to the latest news reports, the [Russian] vaccine also showed little to no side effects on humans participating in the vaccination.

Here, the important reasons cited in choosing a brand are the result of the clinical trials, the advantage of being the first mover, transparency and effective communication. Another person said:

> [Regarding] the Sputnik vaccine, Russia is well known worldwide for medicines in general. I would trust all of them, because the vaccine wouldn't reach the people if it doesn't pass all the requirements and regulations. The price would not matter because it would become a necessity. But also they should not take advantage, because this is a global issue and it would reflect on them later on.

Such responses indicate the importance of the element of trust and the brand.

5.3 Research question 3 – does country of origin play an influential role in adopting the vaccine?

Conclusive evidence could not be reached in the case of country of origin. Mostly, the views were contradicting similar to other findings from the literature. Consumer decision-making and country of origin effects are widely researched topics, and many studies have concluded that consumers still perceive products from advanced countries to have higher quality; this is a kind of quality perception in relation to country-of-origin information (Karimov and Murad, 2019). However, there have been increasing debates and little consensus over its conceptualization and importance (Alexander *et al.*, 2010; Samiee *et al.*, 2016). Several studies reported a positive country of origin (COO) influence on buyers' evaluations and choices (Kalicharan, 2014). However, studies on Generation Z have found that the country of origin has little effect on their purchase decisions (Sharma, 2011).

In the current study, the results were divided and the majority favored the vaccines from China and Russia. According to one respondent:

> In my opinion, I would choose China's vaccine because of the result of clinical trials indicating that almost 30 days have passed without coronavirus [symptoms]. I think that the vaccine developed by China is the best in tackling COVID-19, because they have a billion people to test on.

Another respondent shared, "I think the best vaccine would be the one from China, as it was the main origin of the COVID-19, and many people got the virus there and were cured from it." The advocates of the Chinese vaccine believed that because China had the first experience in tackling the virus, they must be good at making an effective vaccine. As one respondent shared:

> Honestly, I personally don't consider any of the vaccines best to tackle the COVID-19 situation, but in my opinion, the vaccine being developed in China may be the best to tackle COVID-19, because the whole situation of the coronavirus began in China, and I am guessing they are more aware about the disease than any other country.

However, there were responses that favored the Russian vaccine over the Chinese vaccine: "Russia's vaccine should be trusted more because they were ahead of everyone and they did their research. Also, in China, the virus spread from there, so people may not trust the vaccine coming from China." Another respondent stated, "in my opinion, I believe the best vaccine to tackle COVID-19 is the Sputnik vaccine from Russia, as it already says it is ahead of the rat race and is now available, meaning it has been proven effective." One student had a comprehensive response comparing the three vaccines:

> According to recent news, the trials of the Oxford vaccine were stopped due to some side effects seen on the people who were present for the trial. When we compare the three vaccines, I would be willing to test the vaccine that has been developed by Russia. This is mainly because

> the first person to do the trial for the Russian vaccine was the president of the country himself, which gives great confidence to people to test on them as well. Yes, it is true that my selection of vaccine will be affected by the country, brand, price, and the amount of side effects shown by the vaccine. My decision-making will be majorly affected by the amount of side effects more than price, brand, or anything else. This is mainly because the vaccine can have a direct effect on your health, so basically we will be choosing the one that has fewer side effects.

The role of a political leader in instilling confidence in a vaccine was reflected in the previous response, along with the emphasis on the quality of the vaccine. Three responses were in favor of the Oxford vaccine; hence, the responses were divided. In other words, the country of origin does not matter to the decision-making being made by Generation Z. Moreover, Western brands do not have a perceived advantage over others.

5.4 Research question 4 – which attribute of innovation has a profound effect on vaccine adoption among generation Z and why?

The perceived characteristics associated with innovation are called "attributes." The research question was framed to gain insights into the attributes that could play an influential role in vaccine adoption among Generation Z. In the current study; the business students were aware of Rogers' (1983) classification of attributes that could influence the adoption of an innovation. The question was based on the attributes of relative advantage, compatibility, complexity, trialability and observability. For high-risk, expensive and obtrusive innovation, trialability could be an important attribute. In the case of innovations embedded with high degrees of ambiguity or tacit knowledge in their operation, the observability attribute could play an influential role in the DOI process (Dearing, 2008).

The students were asked to rate those attributes in terms of their importance. The results were unanimous: all 30 respondents identified observability as the key attribute in the case of vaccine adoption. Observability is the degree to which the results or benefits of the products are visible to potential adopters. On further probing as to why they put observability as the most important attribute, the responses all pointed to the results of the clinical trials. Some responses were crisp: "I think the most important reason for taking the vaccines is the result of clinical trials, so if it works, the brand is successful." Another response connected observability with word-of-mouth:

> As a customer, I believe that clinical trials and word-of-mouth have the greatest influence on my decision. They are related to each other, as the people who volunteered in the result of clinical trials will give word-of-mouth, and the doctors will be providing the results of the effect as they are the experts. Moreover, these two factors will demonstrate the effectiveness of the vaccine, which is the value needed.

Three respondents also highlighted the role of the government along with observability. As one of them said:

> If given a choice as a consumer, I will choose the vaccine with the highest number of successful clinical trials. However, it may also depend on the government of the country in which I reside. If the government has decided, then I will not have an option to choose in the first place.

Going through the responses, 24 of them provided a suggestion to enhance observability. Word-of-mouth, the role of government and opinion leaders were highlighted in their responses. On further analysis, the responses indicated that in the case of the vaccine, although Generation Z thinks that the product will have a high degree of relative advantage, if the product is complex and if there is little information on the product, quality and time taken for clinical trials, they need to trust a product by observing the results and this could be done through word-of-mouth and validation from opinion leaders. The respondents also suggested that there is a low degree of trialability associated with the product. As one of the respondents succinctly said: "I would not be trying the vaccine, as it could have some side

effects. Let my friends try it out, then I will follow." The responses point to the importance of communicating the vaccine's benefits through word-of-mouth. Furthermore, opinion leaders could be tapped to enhance the observability attribute, which could play a significant role in faster vaccine adoption among a larger group of people (Figure 1).

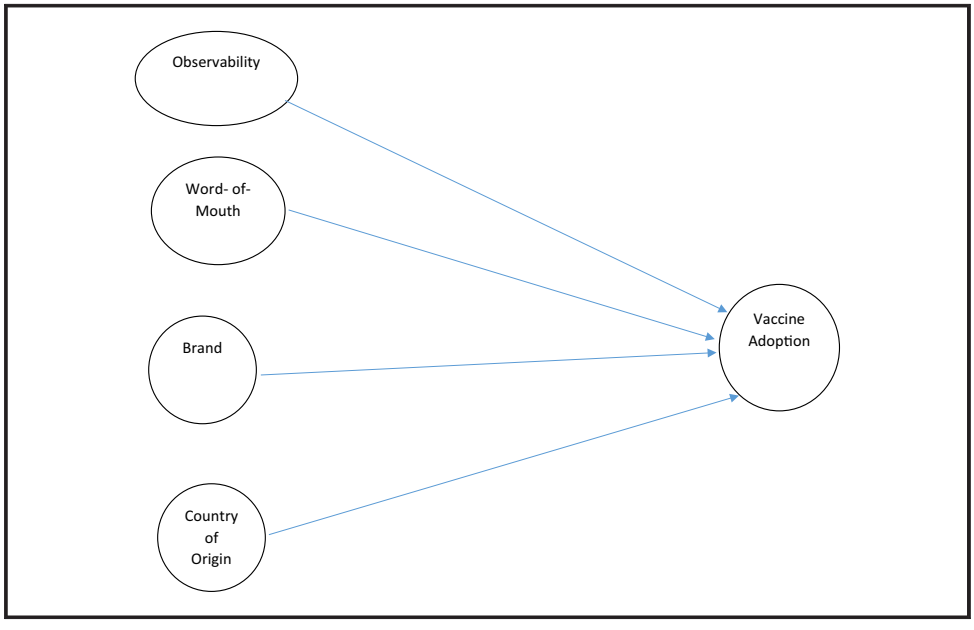
6. Discussions

All the 30 respondents have answered observability as the number one attribute that has a profound effect on Vaccine Adoption among Generation Z. In addition, from analyzing the response for questions related to the country of origin, brand and word of mouth, the majority of them have also pointed out the significance of observability in their response, for example, in an answer to a question related to brand one respondent pointed out "in my opinion, I will be trusting the UK mostly and yes, the brand and county do affect my decision. However, the result clinical trials is the more critical aspect in my decision-making." Responses like this suggest that compared to brand and country of origin, observability has a profound impact on the adoption of the vaccine.

The findings confirm the results of Dearing (2008), who reported that observability is the critical attribute that could influence DOI with relation to innovation, which has a high degree of ambiguity. The production of the COVID-19 vaccines is in different stages. The Sputnik vaccine from Russia has already been adopted by many countries, including the UAE and the Chinese vaccines are also in a similar stage of development. In comparison, the Oxford vaccine is still in the clinical trial stage and has recently reported some setbacks in the trial stage. The other companies are also striving hard to expedite production and trials. This creates a lot of ambiguity in the market, and for this reason, observability has become the key attribute among Generation Z.

Word-of-mouth seems to be another important influencer in the adoption of the vaccine. Bourdieu (1984) suggested that social signals through word-of-mouth and advertising are a powerful factor in the adoption of innovation. These signals are transmitted to other individuals who follow the consumption behavior of the reference group (Van den bulte and Joshi, 2007). This could play a vital role in the implementation of innovation in the case of Generation Z, as

Figure 1 Factors influencing adoption



they do not want to be left out from their group as a person who is not yet vaccinated. Though some critics argue that word-of-mouth influence has been overemphasized in diffusion research (Van den bulte and Lilian, 2001), the results of the current study indicate that it is still an important variable that could influence diffusion among Generation Z. The study finds that observability and word-of-mouth have a reciprocating relationship, such that the higher the degree of observability, the stronger the word-of-mouth. This indicates the importance of effectively communicating vaccine information and its positive effects to members of Generation Z. This can be done by tapping opinion leaders and other influencers to deliver compelling messages and by choosing the right channels of communication.

6.1 Brand and generation Z members

Generation Z members seem to have a complex relationship with the brand, unlike their predecessors from Generations X and Y. Generation Z members have higher expectations from their favorite brands; they are also less loyal to brands and care more about the experience (Williams and Page, 2011). The results of the current study confirmed this complex relationship; the respondents were only aware of two brands. Although the majority of the responses favored Western brands (in this case, a vaccine from Oxford), they were willing to adopt only based on the results of the clinical trials. The brand value will only be enhanced based on the quality. Here, quality refers to the effectiveness of the vaccine in fighting the virus and having few side effects. Some of them favored the Sputnik vaccine from Russia, saying they trusted this vaccine based on its successful clinical trials. Here again, the observability attribute plays a crucial role in the adoption of the vaccine.

6.2 Country of origin and generation Z members

Decades of research have led to one conclusion: the COO of a product can influence customers' evaluative judgments of it (Kan *et al.*, 2014). Only within recent years has this conclusion been called into question (Karimov and Murad, 2019). The COO effect is defined as the "extent to which the place of manufacture influences consumer evaluations and product-related decisions" (Kabadayi and Lerman, 2011). In contrast, the current study reveals that there is no particular affinity to the country of origin among Generation Z. The respondents preferred vaccines from Russia and China. The underlying reason behind this choice was the perception of successful clinical trials and the belief that the products were effective with fewer side effects.

7. Conclusion and implication

The reluctance to take a vaccine is a substantial threat to global health and is a top 10 priority of the World Health Organization (World Health Organization, 2019). The studies regarding vaccines focus on the supply side and are limited in terms of vaccine adoption, which is as critical as the production (Su *et al.*, 2020). The study contributes to the consumer behavior literature by identifying the key influencing factors among Generation Z in the context of the DOI theory. This information can be used to assist governments, medical boards, companies who are developing and distributing the vaccines and other stakeholders who are at the forefront in the fight against the pandemic in increasing the adoption rate of the COVID-19 vaccines. Theoretically, the study provides insight into the critical factors that could influence the adoption rate of the vaccine among young consumers. The study is a unique attempt to use the DOI theory in the adoption of the COVID 19 vaccine. The study reiterates the complex relationship between Brand and Generation Z (Williams and Page, 2011), the Significance of Observability related to DOI (Dearing, 2008) and confirms that COVID 19 as stress inducing among Generation Z (Schaeffer and Lee, 2020).

As Generation Z consumers behave differently, unlike other generations, Marketing to them is a challenge (Chaturvedi *et al.*, 2020). A study done in UAE by Abu Dhabi Public Health

Center found out that Covid-19 vaccines in Abu Dhabi are 93% effective at preventing hospitalization, while the efficacy of vaccinations at reducing the need for an ICU admission is 95% (Mansoor, 2021). Marketers should put additional efforts into promoting these results about the vaccine using the proper communicational channels. A recent study by Ameen and Anand (2020) found out that social influencers highly influence Generation Z in UAE. Social media Campaigns highlighting the effectiveness of the vaccine by influencers who has many followers on their social media accounts such as Twitter and Instagram could enhance the observability and trigger word of mouth among Generation Z. Youtube is another effective channel to reach out to the younger population, it has a cognitive, affective and behavioral attitude among Generation Z Consumers (Duffett, 2020).

In terms of limitations, this study is limited to only a small cohort of Generation Z respondents in the UAE. Similar studies could be conducted among other groups and in different countries. Second, a quantitative study testing the proposed model could provide more insights into the significance of observability. Finally, the study was conducted in the relatively earlier stage of the development of these vaccines. Thus, the rapid changes in market characteristics and product characteristics of the resulting vaccines, which could affect consumer perceptions, must be considered in future works.

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