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Information Seeking through TV and Facebook and Health Belief Model: A Case of Province of Punjab (Pakistan) during Covid-19 Pandemic

Abstract:

Information seeking through the media (mainstream and social media) plays a pivotal role in affecting health behavior of a population at risk during a health crisis. Health Belief Model (HBM) has been widely used to understand and analyze health behavior through its variables including (perceived) knowledge, susceptibility, severity, motivation, self-efficacy, benefits, barriers and cues to action. This study investigates the relationship of information seeking through TV and Facebook with various HBM variables on population of province of Punjab (Pakistan) during Covid-19 pandemic 2019-20. Data were collected through modified Champion Scale (Champion, 1993) from a sample of one thousand respondents selected through simple random sampling technique via online google forms. It is found that for both TV and Facebook correlation coefficient is significant between information seeking and all HBM variables except Facebook with perceived knowledge and benefits. The values of coefficient indicate overall weak correlations however TV has more powerful correlation than Facebook. For HBM variables, respondents do not perceive covid-19 as a severe threat. Moreover, it is found that citizens give preference to get information from international sources as compared to governments (federal and provincial) and reporters and anchors that stand last for seeking information to modify health behavior for covid-19 pandemic in Punjab, Pakistan.

Key words: Health Belief Model; TV; Facebook; Information Seeking; Source; Covid-19; Infectious diseases.

Introduction:

Spread of Infectious diseases can be effectively controlled by adopting preventive behaviors. The adoption of preventive behaviors depends on the availability of information and behavior of a population at risk towards knowledge, susceptibility, prevention and treatment of diseases (Park, Boatwright & Avery, 2019; Oslon, Vos & Sutton, 2020). There are evidences suggesting that during infectious disease outbreak, public media dependency increases to get required information; to be convinced to change their health beliefs and to adopt hygienic behaviors accordingly (Rubin, Amlot, Page & Wessely, 2009; Yoo, Kwon & Pfeiffer, 2013; Sim, Moey & Tan, 2014; Alsulaiman & Renter, 2018).

For decades, mass media has been referred to as a potential means of communication that provides health related information as well as contributing in public behavioral change on a mass level (Wakefield, Loken & Hornik, 2010). Role of mainstream media including TV, newspapers and radio has remained pivotal in controlling malaria, influenza and AIDS outbreak in both developing and developed countries (Wakefield et al., 2010; Chen, Wang, Schneider, Tsai, Jiang, Hung & Lin, 2011; Sim et al., 2014). Gradually, with the evolving technology in recent years, social media is becoming a dominant platform to disseminate health information as it could help people to stay connected with the latest updates related to diseases and to seek valuable guidance to maintain good health (Liu, 2020). Due to the media's ability to change the health behavior, it is found that it could also minimize the risk of pandemic threat, thus, the association is established between disease protective behaviors and health related media usage (Gesualdo, Romani, Pandolfi, Rizzo, Ravà, Lucente & Tozzi, 2010; Park et al., 2019, Gollust, Fowler &

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Niederdeppe, 2020 and Depoux, Martin, Karafillakis, Preet, Wilder-Smith & Larson, 2020). Health belief model (HBM) describes health-related behaviors in an elaborated way (Champion & Skinner, 2008) that are explained later in this study. This model was developed in the 1950s by American psychologists working in the US Public health service (Hochbaum, 1960). Initially, this model helped in understanding the possible reasons of public participation in various health related programs and since then, it is recognized as an appropriate theoretical framework in predicting health behavior (Rosenstock, 2005). Due to the model's ability to explain and predict behavior, it has been widely used in forming influential health communication programs by focusing on HBM variables to address diverse health issues around the globe (Quick, 2010; Alsulaiman & Renter, 2018) and has shown notable success in motivating people to change their behaviors. Compared to other models, during infectious disease outbreak, HBM has been found the most supportive in maintaining health behaviors and throughout the years, it is being used as explanatory framework in various communication researches (Carpenter, 2010; Gryffin, Chen & Erencuc, 2014; Jones, Jensen, Scherr, Brown, Christy & Weaver, 2015; Alsulaiman & Renter, 2018; Xia, Grady, Cacciatore & Nowak, 2019). Along with HBM constructs and the role of media, it is found that other variables such as demographics also affect the individual health behavioral change. It is found that cultural barriers are important in health-related issues on mainstream media in determining the screening behavior of African women towards cervical cancer. Thus, it is recommended that different means of mass communication must manage cultural barriers effectively in covering health issues (Maseko, Huang & Lin, 2019).

Coronavirus 2019-2020 is a recent pandemic, it is identified as a new strain of coronavirus disease (Covid-19) in Wuhan, China (Ward, Li & Tian, 2020); it belongs to a family of coronaviruses that includes Severe Acute Respiratory Syndrome (SARS-COV) and Middle East Respiratory syndrome (MERS-COV). Apparently, this virus targets the respiratory system of humans and symptoms vary from mild to severe including sore throat, fever, flu to multiple organs failure (Balkhi, Nasir, Zehra & Riaz, 2020). Due to the rapid spread of the disease in 114 countries, the World Health Organization (WHO) declared it as a pandemic on 11th march, 2020 (World Health Organization, 2020). The massive viral transmission across the globe paralyzed the health care system globally, thus, it raised the risks of mortality. On 20 July 2020, there were 14,669,624 confirmed cases of coronavirus, and 609,533 deaths had been reported in 213 countries of the world (Worldometer, 2020). Both developed and developing countries equally faced the severe effects of coronavirus, however, it's impact on the countries with poor healthcare systems were worse (Hayat, Rosenthal, Xu, Arshed, Li, Zhai, Desalegn, & Fang, 2020).

Pakistan is a developing country, with more than 210 million populations. It has four provinces namely Punjab, Sindh, Khyber-Pakhtunkhwa and Baluchistan. As far as coronavirus is concerned, it hit Pakistan on February 26, 2020, that rang the alarm bell for the upcoming situation (Gul, 2020; Saqlain, Ahmed, Gulzar, Naz, Munir & Kamran, 2020). At the time of current study, there were a total 265,083 confirmed cases with 5,599 deaths reported in Pakistan (Pakistan Coronavirus: 265,083 Cases and 5,599 Deaths- Worldometer, n.d.). Sindh and Punjab provinces were catastrophically more affected than other areas with the highest numbers of confirmed cases i.e. 113,007 and 90,191 respectively. Since 26 Feb 2020, the government of Pakistan developed a few preventive-strategies to control the transmission of covid-19 as well as the public health officials started to communicate with the public through different media including both mainstream and social media (Hayat et al., 2020). However, these communication strategies could only be effective with public co-operation. For this purpose, Pakistani government & health practitioners launched many health awareness campaigns related to safeguarding measures as advised by WHO i.e. wearing a mask, washing hands, using hand sanitizer, maintaining social distancing and staying at home (Balkhi et al., 2020). The effects of covid-19 on human health, and societies is becoming obvious gradually and it is disastrous. Therefore, it is imperative for the citizens to follow the health guidelines. The magnitude of covid-19 effect is very much dependent on human behavior and it is also associated with their knowledge and health beliefs related to the pandemic. The components of HBM play a significant role to determine any health behavior. Although The sequence for HBM components is not defined properly but these include knowledge, self-efficacy, susceptibility, benefits, motivation, barriers, self-efficacy and cues to action related to a particular disease. (Jones et al., 2015).

Behavior patterns for health are resistant to change yet targeted and persuasive communication could result into the adoption and adaptation of measures that can be proved effective in a fight against contagious diseases both at Individual and community levels. Studies indicate that Individuals reliance on traditional media (Newspapers, radio and TV) and on social media could be proved effective in the whole effort to transform human behavior through communication means. The role of media and patterns of information seeking are more important in developing societies where health care systems are weak and communities lack direct access to health care facilities. This

information is notable for the researchers interested in studying HBM to understand the role of the information medium in determining individuals' health behaviors (Champion & Skinner, 2008).

By considering the above context, HBM is suitable in exploring the behavior of Pakistani public towards covid-19 and their patterns of information seeking during this health crisis. Province of Punjab has the largest population amongst all provinces of Pakistan and it was the second most covid-19 affected region of the country. Moreover, both Punjab and Federal territory enjoy government of ruling party i.e. Pakistan Tehreek-e-Insaf. Therefore, it is selected for the study that has investigated the relationship between information seeking patterns and variables of HBM including perceived knowledge, susceptibility, perceived seriousness, perceived benefits, perceived barriers, self-efficacy and cues to action on the citizens of Punjab. This study also investigates the impact of information sources (Facebook & Television) on afore-mentioned constructs of HBM in Punjab, Pakistan. Moreover, it also explores the behavior of citizens of the Punjab towards health as explained by HBM variables.

Research Questions:

Following are research questions for the study:

RQ1: What is the correlation between information seeking through TV and Facebook with health behavior (as explained by HBM variables) of the population living in the province of Punjab during the covid-19 pandemic in Pakistan?

RQ2. How do various demographics of the population of the province of Punjab play their role in health behavior (as explained by HBM variables) for the citizens of Punjab during covid-19 pandemic in Pakistan?

RQ3: What is the response of citizens of the province of Punjab on different variables of HBM during covid-19 pandemic in Pakistan?

RQ4. How does preference of sources for information seeking on TV and Facebook is correlated to the health behavior (as explained by HBM variables) for the citizens of Punjab during covid-19 pandemic in Pakistan?

Literature Review:

Health Belief Model (HBM)

There is an extensive literature available on a similar subject explaining HBM and its relation with information and demographic variables. Various studies confirm that HBM has been used in predicting human behavior towards severe diseases that includes cancer, severe respiratory syndromes, Ebola, swine flu and influenza (Rubin et al., 2009; Yoo et al., 2013; Taymoori, Berry & Roshani, 2014; Jones et al., 2015; Oh, Lee & Han, 2020; Guidry et al., 2020). The fundamental concept of HBM is that health behavior is dependent on individuals' personal beliefs or perceptions about a disease that help them to decide any change in their behaviors (Hochbaum, 1960). By keeping this notion in view, HBM initially specified only four aspects of individual's perceptions that can predict health behavior namely perceived susceptibility, perceived severity, perceived benefits and barriers; other constructs were added later (Carpenter, 2010). Perceived susceptibility and seriousness are related to risk perception, ill health and level of severity respectively. Although it convinces people to adopt a healthy lifestyle, but it only works positively when individuals believe or perceive that they are at high risk of getting the disease (Hayden, 2014). Perceived susceptibility and severity motivate people to get into actions, for example is to get their children a vaccine for influenza hepatitis B, and to floss their teeth twice a day to avoid a tooth loss (Chen et al., 2011). Whereas, perceived benefits include usefulness for changing a behavior (Fair et al., 2012) and perceived barriers are hindrances in obtaining a new behavior (Green & Murphy, 2014). Among all the aforementioned dimensions, perceived barriers are considered the most powerful, as individuals might evaluate the difficulties first before changing their behavior. Therefore, it might lead them in giving up on adopting a new behavior (Janz & Becker, 1984; Alsulaiman & Renter, 2018). Later on, more factors added to the model that could possibly affect health behavior; it includes modifying variables, self-efficacy and cues to action (Green & Murphy, 2014; Hayden, 2019). Modifying variables such as demographics, ethnicity and knowledge are significant factors that can alter the individuals' perceived benefits of a prevention behavior (Hayden, 2014). Another important belief factor affecting the behavior is self-efficacy, which can be defined as the capacity of an individual to complete a specific task (Champion, Skinner & Menon, 2005). Likewise, a factor cues to action shows that any event, people or signal can

influence people's health behavior, that could be illness of a family member or friend, media awareness campaigns and warning labels on food products (Jones et al., 2015).

Role of Mainstream and Social Media during Health Crisis:

During emerging health crises, information becomes an elementary resource for the public in society. It becomes a significant tool helping in guiding people as well as it reduces the uncertainty and anxiety. Here, the credibility and authenticity of the information is important as fake or misleading news might spread panic and chaos among the public (Kilgo, Yoo & Johnson, 2019). It has been observed that mass media plays a key role in health crisis communication. Various public health professionals and government personnel use different mainstream media (Newspapers, TV, radio) vehicles to educate the audiences (Osafu & Andoh-Arthur, 2020). Television coverage related to public health issues plays an important role in promoting health practices and thus, it is an effective medium in adapting positive health behavior among the public as compared to other mainstream media (Gollust et al., 2020). During the Zika disease outbreak in 2016, it was revealed that information channel preferences also contributed to managing health crises. To that objective role of crisis communication in perceiving risk, preparedness and knowledge of the disease always holds importance (Park et al., 2019). Hence, traditional media has been found as a key facilitator in managing the adverse effects during global health crisis situations like Zika virus and other contagious diseases. It is because of the ability of these platforms to communicate to the mass audiences with authenticity (Oslon et al., 2020). The construction of news content in health emergencies demands attention. It is found that news reports carry more threat information than efficacy information in such situations, probably because of the human psyche to respond more towards threats than information. Although, threat information is necessary to increase the knowledge related to the disease but lack of efficacy information might result into fatalism, fear and hopelessness (Oslon et al., 2020). Thus, it is recommended that health professionals should emphasize on collective and self-efficacy information while communicating through media. The significance of mainstream media has inspired many health systems to establish dedicated outlets to create awareness among masses. Thailand has established a legal public media institution named Thai Public Broadcasting in 2018. Since then it is known as media for health as it is committed to broadcast health campaigns as well as promoting healthy lifestyle among Thai public (Phonsuk & Suphanchaimat, 2019).

In recent years with the rapid emergence in media technology, social media has been playing a crucial role in health crisis communication. Studies of social media usage in health crises indicated towards the potential of new media in transforming public behaviors towards infectious diseases (McCue, 2013; Vos & Buckner, 2016). Because of the popularity of Facebook and twitter, it has been used by health organizations as a medium to communicate across the globe. In 2013, during the H1N1 outbreak World Health organization (WHO) and center for disease control and prevention (CDC) used their official twitter account to address the potential health crisis (Vos & Buckner, 2016). Moreover, public health and government authorities use their official accounts for disseminating efficacy messages and updates on the number of cases and deaths. As a result, efficacy messages encourage the public to respond appropriately. Likewise, considering the health risk communication strategy, public health organizations used social media platforms during the Ebola outbreak in 2016. It is found that content and context of communication messages could be most effective when they are used by familiar health organizations based on public concerns and solution-based messaging with visual images (Guidry, Carlyle, Larose, Perrin, Messner, & Ryan, 2019). Contrarily, the role of social media has also been observed in spreading misleading information related to recent pandemic Covid-19 (Depoux et al., 2020). It is found that panic created by social media platforms travelled faster than the spread of covid-19 infection. Therefore, controlling rumors and misinformation related to covid-19 become important. That is why, WHO created a myth buster webpage, as they believed that social media panic could only be fought with accurate information. Despite the fact that social media can provide rumors to brew, it can serve as an important tool to promote public health behavior, if used wisely (La, Pham, Ho, Nguyen, Nguyen, Vuong, Nguyen, Tran, Khuc, Ho, & Vuong, 2020). Role of traditional media and social media cannot be ignored in an emerging health crisis. Some studies consider the mainstream media role more effective than social media (Park et al., 2019; Casero-Ripollés, 2020; Gollust et al., 2020; Osafu & Andoh-Arthur, 2020); whereas, many studies find social media as an appropriate communication vehicle during such situations (Vos & Buckner, 2016; Guidry et al., 2019).

Infectious Disease Outbreak and Media:

During the global health crisis, the majority of the public depends on the media to seek up-to-date information to make health related decisions accordingly (Wakefield et al., 2010; Lin et al., 2020; Liu, 2020). It is found that media

usage to gain health information has direct effect on both perceived threats and positive expectations for screening of the disease (Yoo et al., 2013) whereas, media and interpersonal communication has no effect on individuals to participate in screening processes indicating its comparative inability to convince for actions. Health behavior is a complex phenomenon that cannot be influenced with a single approach as it is found that health behavioral change is a combination of an individual's personal influence, mass media approaches and emotional appeals (Rosenstock, 2005). Thus, a psychological relationship is established between media content, context and social influences in making and sharing decisions about health behavioral change. To change the health behavior dedicated media health campaigns are designed and executed. These campaigns are found enough persuasive to change the existing health beliefs and social factors affecting the health decisions (Scholz, Jovanova, Baek & Falk, 2020).

Since SARS 2002, many communication scholars have studied the impact of media on variables of Health belief model that describe human behavior. These health beliefs determine whether individuals accept or refuse to take preventive measures against the disease. Wearing a facemask is one of the most important preventive measures in control of infection transmission and it is found that media played an important role in encouraging public to wear a mask particularly during health crisis as well as the increase in use of facemasks in countries i.e. Japan, Thailand and Hong Kong during the SARS outbreak and it was partially due to the media's potential (Sim et al., 2014).

It is found that information seeking from the media helped individuals in adoption of hygienic behavior that resulted in increased sanitizer and tissue use across the British population during the swine flu outbreak (Rubin et al., 2009). Social distancing is another protective measure that helped in breaking the chain of such respiratory disease transmission and it is found that information sources significantly influenced situational awareness and social distancing (Qazi, Qazi, Naseer, Zeeshan, Hardaker, Maitama & Haruna, 2020). In addition to this, it is found that usage of formal (Print media, press releases, Television) and informal (Social media, online reviews, views of family and peer group) information sources during health crises could effectively convince the public to change their health behavior (Olson et al., 2020).

Here, the importance of social media cannot be ignored as it introduces new ways of communication during health crises. A strong relationship is found between social media exposure and public risk perception (Oh et al., 2020), it indicates that social media usage is directly proportionate to risk perception. In case of covid-19, the majority of individuals are dependent on digital media in seeking health related information, however, the coronavirus information usage on social media could evoke severe worry and, that resulted in increased preventive behaviors (Liu, 2020). Repeated media exposure during a health crisis could also lead to serious psychological health problems including anxiety and stress (Garfin, Silver & Holman, 2020). Other than these the repeated exposure could be helpful in adopting protective measures against the disease. There are studies that confirm that people in Pakistan get health related information through different sources of media that significantly help them in adopting a healthy lifestyle to avoid the various infections (Hayat et al., 2020; Balkhi et al., 2020; Malik, 2020; Saqlain et al., 2020).

Method:

For the study quantitative methodology was used. An online survey was conducted by using google forms to collect the data from one thousand respondents belonging to the province of Punjab. Simple random sampling was applied by sharing the questionnaire to the respondent belonging to the different areas of the province of Punjab.

A modified instrument based on HBM Champion's Scale (Champion, 1993) was used to collect the data. Instrument consisting of 58 items was designed. First part of the questionnaire collected demographic information, second part on TV and Facebook information seeking and information sources preferences; and third part collected data for Health Belief Model variables i.e. Perceived knowledge, perceived susceptibility, perceived severity, motivation, self-efficacy, perceived benefits, perceived barriers and cues to action that were measured at five-point Likert scale ranging from strongly disagree to strongly agree.

Analysis & Discussion:

For the items on TV and Facebook and HBM the average of Cronbach's alpha is 0.763. To find the correlation between TV information seeking and Facebook information seeking Pearson correlation coefficient was calculated (Table-1a & Table-1b respectively). It was found that for both TV information seeking and Facebook information seeking correlations for all HBM variables are significant except Facebook information seeking with perceived knowledge and perceived benefits where p-value > 0.05 and p-value > 0.05. The values of correlation coefficient

indicate weak correlation in most of the cases whereas TV information seeking has more powerful correlation as compared to Facebook. The weak correlation is due to complexity of health behavior that is always affected by a myriad of factors in any given population.

Table-1a: Correlation of TV information seeking with Health Belief Model Variables

	HBM Variables	Correlation Coefficient	p. value
1	Perceived knowledge	0.176	0.000*
2	perceived susceptibility	0.148	0.000*
3	Perceived severity	0.118	0.000*
4	Motivation	0.065	0.039*
5	Self-efficacy	0.097	0.002*
6	Perceived benefits	0.206	0.000*
7	Perceived barriers	0.070	0.027*
8	Cues to action	0.142	0.000*

* Correlation is significant at the 0.05 (Two Tailed)

Table-1b: Correlation of Facebook information seeking with Health Belief Model Variables

	HBM Variables	Correlation Coefficient	p value
1	Perceived knowledge	0.057	0.072
2	perceived susceptibility	0.112	0.000*
3	Perceived severity	1.110	0.000*
4	Motivation	0.064	0.042*
5	Self-efficacy	0.103	0.001*
6	Perceived benefits	0.019	0.551
7	Perceived barriers	0.134	0.000*
8	Cues to action	0.100	0.001*

* Correlation is significant at the 0.05 (Two Tailed)

To find the role of demographic variables One-way ANOVA was applied that generated following results.

Table-2: ANOVA Results:

	Age	Gender	Education	Income	Infected with Covid-19
TV Information seeking	0.018*	-	-	0.007*	-
FB information seeking	-	0.000*	0.006*	-	0.029*
Perceived knowledge	-	0.000*	-	-	0.000*
Perceived susceptibility	-	-	-	-	-
Perceived severity	-	0.000*	-	0.055*	-
Motivation	-	0.000*	0.002*	-	0.000*
Self-efficacy	-	-	-	-	0.008*
Perceived benefits	-	0.000*	0.031*	-	0.000*
Perceived barriers	0.000*	0.000*	0.000*	0.000*	-
Cues to action	-	0.004*	-	-	-

* Significant at the 0.05

For the HBM variables, 95 percent confidence intervals for the mean of responses were measured with following results.

Table-3. 95 percent confidence intervals for mean of the responses of HBM variables

HBM Variables	95 percent confidence intervals for means of responses
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		(lower bound, upper bound)
1	Perceived knowledge	3.8205, 3.9045
2	perceived susceptibility	3.2208, 3.3132
3	Perceived severity	2.9195, 3.0295
4	Motivation	4.2725, 4.3585
5	Self-efficacy	3.6847, 3.7723
6	Perceived benefits	3.9450, 4.0350
7	Perceived barriers	3.0896, 3.1774
8	Cues to action	3.4522, 3.5398

Table-3 indicates that only for perceived severity, the citizens of province of Punjab do not believe that pandemic was not lethal in its severity.

Table -4: Correlation of sources for information seeking on TV and Facebook to HBM variables

	HBM Variables		TV information seeking			FB information seeking		
			Federal & Provincial govt.	Reporters & Anchors	International	Federal & Provincial govt.	Reporters & Anchors	International
1	Perceived knowledge	Correlation Coefficient	0.174	0.128	0.233	0.028	0.068	0.161
		p value	0.000*	0.031*	0.000*	–	–	0.002*
2	perceived susceptibility	Correlation Coefficient	0.135	0.106	0.193	0.0172	0.155	0.131
		p value	0.004*	–	0.002*	–	0.015*	0.014*
3	Perceived severity	Correlation Coefficient	0.095	0.089	0.140	0.099	0.142	0.100
		p value	–	–	0.025*	0.047*	0.027*	–
4	Motivation	Correlation Coefficient	0.048	0.068	0.123	0.158	0.005	0.032
		p value	–	–	0.048*	0.002*	–	–
5	Self-efficacy	Correlation Coefficient	0.113	0.141	0.068	0.027	0.177	0.161
		p value	0.015*	0.018*	–	–	0.006*	0.002*
6	Perceived benefits	Correlation Coefficient	0.213	0.183	0.214	0.071	0.052	0.105
		p value	0.000*	0.002*	0.001*	–	–	0.048*
7	Perceived barriers	Correlation Coefficient	0.064	0.043	0.066	0.105	0.109	0.179
		p value	–	–	–	0.036*	–	0.001*
8	Cues to action	Correlation Coefficient	0.133	0.066	0.181	0.009	0.100	0.241
		p value	0.004*	–	0.004*	–	–	0.000*

* Correlation is significant at the 0.05

Table-4 shows that for both TV information seeking and Facebook information seeking citizens of Punjab has given preference to International sources that have significant correlation with HBM variables than local, federal and provincial government sources and Reporters / Anchors for TV and Facebook. Therefore, citizens preferred to get information from international sources than government sources and TV & Facebook sources that stands last for seeking information to modify health behavior for covid-19 pandemic in Punjab.

It is suggested that during infectious disease outbreaks, media messages should contain the relevant information of the disease such as threat, self-efficacy, benefits and motivation so that it could help the public to adopt preventions accordingly (Oslon et al., 2020). As covid-19 pandemic was spreading rapidly in Pakistan, the citizens faced severe health issues that resulted in an increased media use including TV and social media.

Findings of Table 1a & 1b show that respondents sought information from both TV and Facebook to modify their health behavior. TV remained effective for all HBM variables, but Facebook users could not get proper information for knowledge building and perceived benefits for acting upon preventive measures to avoid covid-19 infection. It is believed although an overwhelming amount of information is available on Facebook, yet sifting through that information to make distinction between authentic and fake is a difficult task. Moreover, the effectiveness of that information on health behaviors is also not clear. It is inferred from findings that TV information seeking has powerful correlation as compared to Facebook information seeking, but overall, both mediums offer weak correlation with HBM variables. This could be explained due to the complex nature of health behavioral change that is affected by a plethora of factors and approaches i.e. emotions, demographics and information seeking could be among them (Sim et al., 2014). The comparative effectiveness of TV could be because of its presence between populations for a longer time than Facebook and its reliability because of its usage by multiple sources as a preferred medium of information dissemination than others. Previous studies also indicate that in infectious disease outbreaks TV have remained a popular means of seeking information among the public as it provides quick access to updated & reliable information (Tuggle & Huffman, 2001; Mitchell, Gottfried, Barthel & Shearer, 2016). Findings of ANOVA show the role of demographics in affecting the health behavior during covid-19 for respondents of the Punjab. It is clear that gender, self-infection with covid-19 and education appeared to be playing more important roles than other variables. The results show the complexity of health behavior in adopting appropriate health prevention and perceived behaviors against the disease across the diverse nature of any population (Sim et al., 2014).

The results of 95 percent confidence intervals for mean responses show that citizens of Punjab did not take severity of covid-19 infection seriously. Their health behavior is affected by knowledge, susceptibility, self-efficacy, benefits, barriers, motivation and cues to action. It shows that respondents feel more motivated to take care of themselves against covid-19 during pandemic.

Findings of the study show that for both TV and Facebook information seeking, international sources are given preference to affect health behavior of the population of Punjab. Respondents placed federal and provincial government sources at second place whereas TV channels and Facebook own sources including reporters and anchors came in last. These findings indicate towards a mistrust that respondents have shown for reporters and anchors while seeking information for serious issues like health. What made them prefer international sources to affect their health behavior needs more investigation, but observation shows that international sources communicated the covid-19 related information with candid presentation, convincing facts and with emotional tone. The reason for giving preferences to federal and provincial government sources is due to the active role of these governments' information machineries especially by federal government that broadcasted press briefings on a daily basis from the National Command and Control Center of Islamabad that was established to synchronize covid-19 related efforts of all stakeholders. The preference on international sources for health-related issues is common practice amongst the citizens of many countries. It is found that public of Arab countries rely on international means of information concerning health message as well as it was identified that many countries managed their diet and health risk according to the information obtained from international news agencies (Faour-Klingbeil, Osaili, Al-Nabulsi, Jemni, & Todd, 2020). It is noted that during the covid-19 outbreak in china, local and global media became active in educating the communities by providing health information on various aspects of novel coronavirus such as spread, symptoms and prevention (Liu et al., 2020). These could be the reasons that citizens of Pakistan preferred more international sources than government sources, TV channels reporters and anchors to adapt health behavior during covid-19 crisis.

Conclusion:

It is concluded that information seeking from both Facebook and TV played an important role in affecting health behavior as described by variables of health belief model for the population of the province of Punjab. The complexity of health behavior is evident through the findings of this study. The results of current study show that TV information seeking remains more powerful than Facebook during the coronavirus pandemic in Pakistan. Moreover, other factors that contributed in modifying healthy behavior towards the disease were identified as demographic variables (gender, personal infection with Covid-19 and education) and preference to the source of information. The responses indicate that the majority was involved in regular practices of protective measures i.e. washing hands, wearing a mask and avoiding crowded places despite not taking the severity of the disease very seriously.

References:

- Alsulaiman, S., & Rentner, T. (2018). The Health Belief Model and Preventive Measures: A Study of the Ministry of Health Campaign on Coronavirus in Saudi Arabia. *Journal of International Crisis and Risk Communication Research*, 1(1), 27–56. <https://doi.org/10.30658/jicrcr.1.1.3>
- Balkhi, F., Nasir, A., Zehra, A., & Riaz, R. (2020). Psychological and Behavioral Response to the Coronavirus (COVID-19) Pandemic. *Cureus*, 12(5). <https://doi.org/10.7759/cureus.7923>
- Carpenter, C. J. (2010). A meta-analysis of the effectiveness of health belief model variables in predicting behavior. *Health Communication*, 25(8), 661–669. <https://doi.org/10.1080/10410236.2010.521906>
- Casero-Ripollés, A. (2020). Impact of covid-19 on the media system. Communicative and democratic consequences of news consumption during the outbreak. *Profesional de La Informacion*, 29(2), 1–11. <https://doi.org/10.3145/epi.2020.mar.23>
- Champion V. L. (1993). Instrument refinement for breast cancer screening behaviors. *Nursing research*, 42(3), 139–143.
- Champion, V. L., & Skinner, C. S. (2008). The health belief model. In K. Glanz, B. K. Rimer, & K. Viswanath (Eds.), *Health behavior and health education: Theory, research, and practice* (pp. 45–65). San Francisco: Jossey-Bass.
- Champion, V., Skinner, C. S., & Menon, U. (2005). Development of a self-efficacy scale for mammography. *Research in Nursing and Health*, 28(4), 329–336. <https://doi.org/10.1002/nur.20088>
- Depoux, A., Martin, S., Karafillakis, E., Preet, R., Wilder-Smith, A., & Larson, H. (2020). The pandemic of social media panic travels faster than the COVID-19 outbreak. *Journal of Travel Medicine*, 27(3), 1–2. <https://doi.org/10.1093/jtm/taaa031>
- Fair, A. M., Monahan, P. O., Russell, K., Zhao, Q., & Champion, V. L. (2012). The interaction of perceived risk and benefits and the relationship to predicting mammography adherence in African American women. *Oncology Nursing Forum*, 39(1), 53–60. <https://doi.org/10.1188/12.ONF.53-60>
- Faour-Klingbeil, D., Osaili, T. M., Al-Nabulsi, A. A., Jemmi, M., & Todd, E. C. D. (2020). The public perception of food and non-food related risks of infection and trust in the risk communication during COVID-19 crisis: A study on selected countries from the Arab region. *Food Control*, 121, 107617. <https://doi.org/10.1016/j.foodcont.2020.107617>
- Garfin, D. R., Silver, R. C., & Holman, E. A. (2020). The novel coronavirus (COVID-2019) outbreak: Amplification of public health consequences by media exposure. *Health Psychology*, 39(5), 355–357. <https://doi.org/10.1037/hea0000875>
- Gesualdo, F., Romano, M., Pandolfi, E., Rizzo, C., Rav, L., Lucente, D., & Tozzi, A. E. (2010). Surfing the web during pandemic flu: Availability of World Health Organization recommendations on prevention. *BMC Public Health*, 10(1), 561. <https://doi.org/10.1186/1471-2458-10-561>
- Gollust, S. E., Fowler, E. F., & Niederdeppe, J. (2019). Television News Coverage of Public Health Issues and Implications for Public Health Policy and Practice. *Annual Review of Public Health*, 40(1), 167–185. <https://doi.org/10.1146/annurev-publhealth-040218-044017>
- Green, E., & Murphy. (2014). Health Belief Model. *Encyclopedia of Health Communication*. <https://doi.org/10.4135/9781483346427.n211>
- Gryffin, P., Chen, W., & Enguc, N. (2014). Knowledge, Attitudes and Beliefs of Meditation in College Students: Barriers and Opportunities. *American Journal of Educational Research*, 2(4), 189–192. <https://doi.org/10.12691/education-2-4-2>

- Guidry, J. P. D., Carlyle, K. E., Larose, J. G., Perrin, P., Messner, M., & Ryan, M. (2019). Using the health belief model to analyze instagram posts about Zika for public health communications. In *Emerging Infectious Diseases*. <https://doi.org/10.3201/eid2501.180824>
- Guidry, J. P. D., Meganck, S. L., Perrin, P. B., Messner, M., Lovari, A., Carlyle, K. E., Guidry, J. P. D., Meganck, S. L., Perrin, P. B., & Messner, M. (2020). # Ebola : Tweeting and Pinning an Epidemic # Ebola : Tweeting and Pinning an Epidemic. *Atlantic Journal of Communication*, 00(00), 1–14. <https://doi.org/10.1080/15456870.2019.1707202>
- Gul, A. (2020). *Pakistan Detects First Coronavirus Cases, Links to Iran Outbreak | Voice of America - English*. Voice of America (VOC). <https://www.voanews.com/science-health/coronavirus-outbreak/pakistan-detects-first-coronavirus-cases-links-iran-outbreak>
- Hayat, K., Rosenthal, M., Xu, S., Arshed, M., Li, P., Zhai, P., Desalegn, G. K., & Fang, Y. (2020). View of Pakistani residents toward coronavirus disease (COVID-19) during a rapid outbreak: A rapid online survey. *International Journal of Environmental Research and Public Health*, 17(10), 1–10. <https://doi.org/10.3390/ijerph17103347>
- Hayden. (2014). *Introduction to Health Behavior Theories*. NY: Jones & Bartlett Learning.
- Hayden, J. (2019). Introduction to Health Behavior Theory. In *Introduction to Health Behavior Theory* (Vol. 3). <https://books.google.com.pk/books?id=9YZSAAAAQBAJ&printsec=frontcover#v=onepage&q&f=false>
- Hochbaum, G. M. (1960). Research Relating to Health Education. *Health Education & Behavior*, 1(8), 10–21. <https://doi.org/10.1177/109019816000100802>
- Janz NK and Becker MH. (1984). The Health Belief Model. A decade later. 1984; 11 (1): 1-47. *Health Education Quarterly*, 11(1), 1–47. <https://journals.sagepub.com/doi/10.1177/109019818401100101>
- Jones, C. L., Jensen, J. D., Scherr, C. L., Brown, N. R., Christy, K., & Weaver, J. (2015). The Health Belief Model as an Explanatory Framework in Communication Research: Exploring Parallel, Serial, and Moderated Mediation. *Health Communication*, 30(6), 566–576. <https://doi.org/10.1080/10410236.2013.873363>
- Kilgo, D. K., Yoo, J., & Johnson, T. J. (2019). Spreading Ebola Panic: Newspaper and Social Media Coverage of the 2014 Ebola Health Crisis. *Health Communication*, 34(8), 811–817. <https://doi.org/10.1080/10410236.2018.1437524>
- La, V. P., Pham, T. H., Ho, M. T., Nguyen, M. H., Nguyen, K. L. P., Vuong, T. T., Nguyen, H. K. T., Tran, T., Khuc, Q., Ho, M. T., & Vuong, Q. H. (2020). Policy response, social media and science journalism for the sustainability of the public health system amid the COVID-19 outbreak: The vietnam lessons. *Sustainability (Switzerland)*, 12(7). <https://doi.org/10.3390/su12072931>
- Lin, C. A., Xu, X., & Dam, L. (2020). Information source dependence, presumed media influence, risk knowledge, and vaccination intention. *Atlantic Journal of Communication*, 00(00), 1–12. <https://doi.org/10.1080/15456870.2020.1720022>
- Liu, P. L. (2020). COVID-19 Information Seeking on Digital Media and Preventive Behaviors: The Mediation Role of Worry. *Cyberpsychology, Behavior, and Social Networking*, 00(00), 1–6. <https://doi.org/10.1089/cyber.2020.0250>
- Liu, Q., Zheng, Z., Zheng, J., Chen, Q., Liu, G., Chen, S., Chu, B., Zhu, H., Akinwunmi, Ba., Huang, J., Zhang, C. J. P., & Ming, W. K. (2020). Health communication through news media during the early stage of the covid-19 outbreak in China: Digital topic modeling approach. *Journal of Medical Internet Research*, 22(4), e19118. <https://doi.org/10.2196/19118>
- McCue, T. J. (2013). Twitter Ranked Fastest Growing Social Platform In The World. *Forbes*. <https://www.forbes.com/sites/tjmccue/2013/01/29/twitter-ranked-fastest-growing-social-platform-in-the-world/#1519af6451a4>

- Rosenstock, I. M. (2005). Why people use health services. In *Milbank Quarterly* (Vol. 83, Issue 4). <https://doi.org/10.1111/j.1468-0009.2005.00425.x>
- Quick, B. L. (2010). Applying the health belief model to examine news coverage regarding steroids in sports by ABC, CBS, and NBC between March 1990 and May 2008. *Health Communication, 25*(3), 247–257. <https://doi.org/10.1080/10410231003698929>
- Malik, S. (2020). Knowledge of COVID-19 Symptoms and Prevention among Pakistani Adults: A Cross-sectional Descriptive Study. <https://doi.org/10.31234/osf.io/wakmz>
- Maseko, T. N., Huang, H. C., & Lin, K. C. (2019). Cervical cancer screening behavior of African women: The Rosenstock health belief model assessment. *Health Care for Women International, 0*(0), 1–16. <https://doi.org/10.1080/07399332.2019.1677665>
- Mitchell, A., Gottfried, J., Barthel, M., & Shearer, E. (2016). The Modern News Consumer: News Attitudes And Practices In The Digital Era. *Pew Research Center, 7*, 48.
- Oh, S. H., Lee, S. Y., & Han, C. (2020). The Effects of Social Media Use on Preventive Behaviors during Infectious Disease Outbreaks: The Mediating Role of Self-relevant Emotions and Public Risk Perception. *Health Communication, 00*(00), 1–10. <https://doi.org/10.1080/10410236.2020.1724639>
- Olson, M. K., Vos, S. C., & Sutton, J. (2020). Threat and Efficacy in Television News: Reporting on an Emerging Infectious Disease. *Western Journal of Communication, 00*(00), 1–18. <https://doi.org/10.1080/10570314.2020.1755721>
- Osafo, J., & Andoh-Arthur, J. (2020). Engaging Television for Public Education and Counselling on Suicide: a Case Example from Ghana. *International Journal for the Advancement of Counselling*. <https://doi.org/10.1007/s10447-020-09398-7>
- Park, S., Boatwright, B., & Johnson Avery, E. (2019). Information channel preference in health crisis: Exploring the roles of perceived risk, preparedness, knowledge, and intent to follow directives. *Public Relations Review, 45*(5), 101794. <https://doi.org/10.1016/j.pubrev.2019.05.015>
- Pakistan Coronavirus: 265,083 Cases and 5,599 Deaths - Worldometer.* (n.d.). Retrieved July 20, 2020, from <https://www.worldometers.info/coronavirus/country/pakistan/>
- Phonsuk, P., & Suphanchaimat, R. (2019). *A Report of Effective Intervention Strategies Conducted by Non-Health Sectors 12*(3).
- Qazi, A., Qazi, J., Naseer, K., Zeeshan, M., Hardaker, G., Maitama, J. Z., & Haruna, K. (2020). Analyzing situational awareness through public opinion to predict adoption of social distancing amid pandemic COVID-19. *Journal of Medical Virology, 92*(7), 849–855. <https://doi.org/10.1002/jmv.25840>
- Rubin, G. J., Amlôt, R., Page, L., & Wessely, S. (2009). Public perceptions, anxiety, and behaviour change in relation to the swine flu outbreak: Cross sectional telephone survey. *BMJ (Online), 339*(7713), 156. <https://doi.org/10.1136/bmj.b2651>
- Saqlain, M., Ahmed, A., Gulzar, A., Naz, S., Munir, M. M., & Kamran, S. (2020). *Public 's Knowledge and Practices regarding COVID-19: A cross-sectional survey from Pakistan.* <https://doi.org/10.1101/2020.06.01.20119404>
- Scholz, C., Jovanova, M., Baek, E. C., & Falk, E. B. (2020). Media content sharing as a value-based decision. *Current Opinion in Psychology, 31*, 83–88. <https://doi.org/10.1016/j.copsyc.2019.08.004>
- Sim, S. W., Moey, K. S. P., & Tan, N. C. (2014). The use of facemasks to prevent respiratory infection: A literature review in the context of the Health Belief Model. *Singapore Medical Journal, 55*(3), 160–167. <https://doi.org/10.11622/smedj.2014037>
- Taymoori, P., Berry, T., & Roshani, D. (2014). Differences in health beliefs across stage of adoption of mammography in Iranian women. *Cancer Nursing, 37*(3), 208–217.

<https://doi.org/10.1097/NCC.0b013e31829194bc>

- Tuggle, C. A., & Huffman, S. (2001). Live reporting in television news: breaking news or black holes? *Journal of Broadcasting and Electronic Media*, 45(2), 335–344. https://doi.org/10.1207/s15506878jobem4502_9
- Vos, S. C., & Buckner, M. M. (2016). Social Media Messages in an Emerging Health Crisis: Tweeting Bird Flu. *Journal of Health Communication*, 21(3), 301–308. <https://doi.org/10.1080/10810730.2015.1064495>
- Wakefield, M. A., Loken, B., & Hornik, R. C. (2010). Use of mass media campaigns to change health behaviour. In *Lancet (London, England)* 376(9748). Elsevier. [https://doi.org/10.1016/S0140-6736\(10\)60809-4](https://doi.org/10.1016/S0140-6736(10)60809-4)
- Ward, M. P., Li, X., & Tian, K. (2020). Novel coronavirus 2019, an emerging public health emergency. In *Transboundary and Emerging Diseases* (Vol. 67, Issue 2, pp. 469–470). Blackwell Publishing Ltd. <https://doi.org/10.1111/tbed.13509>
- World Health Organization, W. (2020). *WHO Director-General's opening remarks at the media briefing on COVID-19 - 11 March 2020*. WHO Director General's Speeches. <https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020>
- Worldometer. (2020). *Coronavirus Cases & Mortality*. Worldometer. <https://doi.org/10.1101/2020.01.23.20018549V2>
- Xia, T., Grady, C., Cacciatore, M., & Nowak, G. (2019). Understanding Flu Vaccination Acceptance Among U.S. Adults: The Health Belief Model and Media Sources. *Proceedings of the International Crisis and Risk Communication Conference*, 2(2019), 35–37. <https://doi.org/10.30658/icrcc.2019.10>
- Yoo, W., Kwon, M.-W., & Pfeiffer, L. J. (2013). Influence of communication on colorectal cancer screening: Revisiting the Health Belief Model. *Journal of Communication in Healthcare*, 6(1), 35–43. <https://doi.org/10.1179/1753807612y.0000000023>