

Evaluating Public Health Campaigns on Social Media using the Health Belief Model: Evidence from Khyber Pakhtunkhwa, Pakistan

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Abstract

*This study aims to evaluate the impact of four health campaigns—Coronavirus (COVID-19) in Khyber Pakhtunkhwa, the Sehat Sahulat Programme, the Integrated Vector Control Programme, and the Insulin for Life Programme—on social media users' perceptions of vulnerability, perceived benefits, perceived barriers, and the severity of health issues. Additionally, it explores how social media users in Khyber Pakhtunkhwa process campaign content. The study employs the health belief model to provide a theoretical framework for understanding these issues. A quantitative approach was adopted, and a survey of 400 respondents from 12 districts in Khyber Pakhtunkhwa was conducted using multistage sampling to collect data. Independent samples *t*- tests and one-way ANOVA were used to analyze the data. The study found both significant and insignificant differences across demographics and social media exposure regarding vulnerability, the severity of health issues, perceived benefits, perceived barriers, attitudes toward health information, and the influence of indirect communication channels. The results indicate no significant correlation between social media exposure and vulnerability, the severity of health issues, perceived benefits, perceived barriers, attitudes toward health information, or the influence of indirect communication channels.*

Keywords: Health belief model, Perceived benefits, Social media, Perceived barriers, Severity of health issues, Vulnerability.

1. Introduction

In Pakistan, many social projects for the improvement of people's lifestyles are carried out through the medium of television and radio. Health awareness campaigns represent the most notable initiative among these social activities. Unfortunately, the efforts were not successful and in avoiding diseases, people were unable to respond to the media messages. The commercials relating to family planning have also been overlooked by the public due of shyness. With the improvement in social media, however, it is feasible to read such communications separately. In addition, governmental and non-governmental groups are more focused on using social media to

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advocate for the promotion of health literacy. According to the World Health Organization (2009), “Health Literacy has been described as the cognitive and social skills which determine the motivation and ability of individuals to obtain access to, understand and use information in ways which promote and preserve good health”.

In the age of technological advancement, social media networking has shown to be an efficient means of connecting people. There are many social media tools that allow people to access the content of newspapers, television, and radio. Having a smart phone is essential to accessing social media content. According to Farooq (2019), in Pakistan, 37 million active social media users were observed in January 2019, which is about 18 percent of the population. Public relations, propaganda, marketing, and social campaigning are all common applications of social media, thanks to its wide availability to everyone from government agencies to private firms to advertisers to non-profit organizations to business owners. Moreover, Boczkowski and Mitchelstein (2013) highlight that, the use of the internet and social media consumption has been employed at the macro level as indicators of the impact of education and awareness campaigns. According to Robinson, Tansil et al. (2014), health awareness campaigns are multi-faceted efforts to create messages that are intended to educate and persuade target audiences to adopt and maintain healthy habits. The campaigns operations result in many outcomes that include removal of barriers to changing a behavior, motivating individuals towards following healthy social norms and imparting the sense that the change is good for them. In this way new habits are cultivated and hence the goal of a campaign is achieved.

The government of Khyber Pakhtunkhwa, Pakistan, and other social welfare groups have used social media profiles on their websites to conduct health communication campaigns in recent years. In addition, these campaigns received a lot of money. To learn more about this topic, a study has been conducted in Khyber Pakhtunkhwa, Pakistan, to assess the impact of health communication campaigns using social media. The following health-related campaigns were examined in this study:

1.1 Corona Virus (Covid-19) at Khyber Pakhtunkhwa

This awareness campaign focuses on creating awareness among the people of Khyber Pakhtunkhwa. Various social media posts were promoted on <https://www.facebook.com/HealthKPGovt/> with the purpose to sensitize and educated the public regarding the corona pandemic.

1.2 Sehat Sahulat Programme

This is one of the major programme of the Khyber Pakhtunkhwa Govt. led by Pakistan Tehreek-e-Insaf (PTI), this is considered as a blessing for millions of patients in the province. In September 2016, Sehat Insaf Card that was launched that aimed to provide free-of-charge health care to families especially living below the poverty line.

1.3: Integrated Vector Control Program

The provincial Roll Back Malaria (RBM) programme was changed in 2014 to the Integrated Vector Management Program with certain amended tasks and responsibilities due to the rising trend of VBDs in KPK, particularly leishmaniosis. Since 2016, the province has had frequent dengue epidemics, especially in Peshawar and Swat.

1.4: Insulin for Life Program

If diabetes is not treated, it is the primary cause of heart attacks, kidney failure, non-traumatic amputations, blindness, and kidney failure. It also reduces life expectancy by about 10 years. It has been estimated by World Health Organization (WHO) that the prevalence of diabetes mellitus is 10 % in Pakistan. While in Khyber Pakhtunkhwa there are estimated 2,00,000 patients of diabetes mellitus, which include 20,000 patients of Type 1 insulin dependent. Patients with type I diabetes, who are often young, need insulin for life; without treatment, they will die within a few months. Patients with type 2 diabetes need oral medication, but the majority eventually need insulin to prevent the terrible outcomes mentioned above.

1.5 Significance of the Study

This present research is carried out to evaluate the impact of health communication campaigns executed on the social media users at Khyber Pakhtunkhwa. Till date, no such study has been conducted which focuses on the impact of the specified health campaigns on social media users in Pakistan. Very limited literature is available on the variables taken up in this study in the context of Khyber Pakhtunkhwa, Pakistan. This research provides a foundation for researchers to explore the area in-depth by focusing on various other angles.

1.6 Objectives of the Study

The study is designed to:

- I. Assess the difference among respondents based on the demographic characteristics (gender and location) with regard to health information and vulnerability, severity of health issues, perceived benefits, perceived barriers and attitude towards health information.
- II. Assess the difference among respondents based on the time spent using social media tools for health information and health campaigns with regard to health information and vulnerability, severity of health issues, perceived benefits, perceived barriers and attitude towards health information.
- III. Assess the extent to which the exposure to social media positively correlates to construct of vulnerability, severity of health issues, perceived benefits, perceived barriers and attitude towards health information.

1.7 Hypotheses

H1: There are significant differences in health information, vulnerability, perceived barrier, perceived benefits, severity of health issues, influence of indirect channels of communication and attitude towards health information across the different demographics (gender and location).

H2: There is a positive and strong correlation of exposure to social media (time spent using social media) with health information, vulnerability, perceived barrier, perceived benefits, severity of health issues, influence of indirect channels of communication and attitude towards health information.

2. Literature review

Health communication campaigns are commonly referenced in relation to programs for social marketing or health education. Some educational programs are conducted entirely without the aid of the mass media in clinical or institutional settings. On the other side, social marketing campaigns frequently include marketing techniques that go beyond communication tactics, like ways to increase benefits while lowering expenses to persuade people to adopt healthier habits. Health communication campaigns can be essential or auxiliary to social marketing and health education initiatives. (Zhao, 2020).

Nielsen et al., (2014) outlined how news is produced, conveyed, and discussed in the modern media landscape. According to Oliver and Bryant (2009), this development has been influenced significantly by Facebook and Twitter. High-speed mobile internet gadgets were introduced as a result of a technological breakthrough in the previous century, and significant quantities of money are spent each year to influence people's attitudes on consumer products, health, political candidates, humanitarian causes, and safety measures.

As O'Sullivan et al. (2016) cites that, when it comes to interactivity, accessibility, personalization, and empowerment in the promotion of healthcare and other health interventions, social media has a particular edge over traditional health communication. In areas including emergency medicine, preventative medicine, and patient-provider connection, social media also fosters cross-professional collaboration.

The phrase "social media" refers to all interactive websites, applications, and social networking sites that allow users to create, share, and consume content as well as communicate with others in real time. People can use social media to connect with the rest of the world via the internet (Fucsh, 2021).

Ahadzadeh et al., (2017), focuses on the usage of the internet that become an important component in raising awareness of chronic diseases among Malaysians, according to the discussion. The desire to be healthy has been emphasized through this media, particularly among metropolitan women. The Health Belief Model and the

Technology Acceptance Model were both addressed in this study. However, this study shows that neither of these ideas can account for an individual's cognition capacity when using the internet for health purposes.

Moreover, Alsulaiman et al., (2018) highlights that, those campaigns that uses the factors of the health belief model (HBM) such as perceived susceptibility, severity, perceived benefits, and barriers to practicing health guidelines are considered as successful campaigns. Dunn (2017) concludes that, social networking sites (SNS) have impacted the health campaigns in a positive way due to newer types of media. According to Roy (2016), research indicates that there is a constant increase in the popularity of social media from traditional media.

Although the usual criterion for evaluating the validity of media exposure metrics is political knowledge acquisition, it is uncertain if social media could be expected to deliver such learning. On the one hand, studies found that social media exposure can lead to increased political knowledge (Bode, 2016).

According to Rincon et al. (2021), health knowledge provides extensive and specific information about on illness origin, risk factors, prevalence, transmission, prevention symptomatology, treatment, as well as health services and patient rights. prior research has demonstrated that adequate health information in the community has a positive effect on health promotion and disease prevention.

As per Bujnowska-Fedak and Węgierek (2020), every year, the number of people searching the Internet for health-related information grows substantially. The goal of their study was to see if and how information on health and disease gained through the Internet influenced patients' choices of doctors, as well as how different e-health services influenced patients' choices of doctors.

According to Nishtar et. al. (2013), Pakistan as a federal governance structure has mainly four provinces; named as, Punjab, Baluchistan, Sindh and Khyber Pakhtunkhwa. In 2010, the government through 18th constitutional amendment gave the authority of health aspects to the provinces. Provinces were in a better position to make polices and frame a system at the best of their capabilities. In 2013, a federal health ministry was revived as the Ministry of National Health Services, Regulations, and Coordination. These reforms remade the powers of federal and provincial agencies and brought new administrative challenges.

The findings imply that the campaign messages can result in discussion among the individuals those were exposed to it. However, discussion alone is not enough to bring a healthy change among them. There should be additional follow-up to bring a more action oriented discussion about adopting a health behavior. Therefore, the campaigns need to be rigorous. Nonetheless, the findings suggest that ad-related conversations can lead to quitting-related conversations, which can then influence actual behavioral change (Jeong, 2015).

2.1 Theoretical Framework

The Health Belief Model is another model that was investigated in this study and is commonly utilized in health communication initiatives. The health belief model (HBM) was developed by Becker (1974) based on the work of (Rosenstock, 1966). This approach can be used to assess a person's behavioral changes. It is concerned with the degree to which a person is vulnerable to a disease. Vulnerability is defined by HBM as "the perception of susceptibility and seriousness" (severity of health issue). These two criteria must be considered by the individual before making a decision about a health concern. They must weigh the benefits and drawbacks of engaging in a particular conduct (Nova Corcoran, 2007). Susceptibility, severity, benefits, barriers, and self-efficacy are among the core constructs of the HBM (Champion, 2008).

According to the Health Belief Model (HBM), a number of variables, such as perceived vulnerability, severity, benefits, barriers, cues to action, and self-efficacy, have an impact on health-related behavior. The term "perceived susceptibility" describes how likely someone believes they are to get sick. How seriously someone views a condition and what that signifies are both covered by the term "perceived severity." The effectiveness of a recommended health activity in reducing the risk or severity of a condition is referred to as its perceived benefits. The feelings of expense associated with engaging in a recommended health activity if it is likely to be beneficial in lowering or eliminating the perceived hazard are known as perceived barriers. Self-efficacy is the level of confidence in one's ability to perform the necessary health action. A person with low self-efficacy is less confident in their abilities and is therefore less likely to engage in the behavior. The HBM has been successfully used to address a variety of demographics and health behaviors, including healthy eating, regular exercise, stopping smoking, vaccines, and contraception. It has also been used to address detrimental behaviors, such as following prescribed medical treatments (Kagee and Freeman, 2008).

3. Methodology

Quantitative research method has been used in this study. A survey was utilized to gather data from public. The tool for data collection is a structured Questionnaire. In this study, multistage sampling is used. "Multi-stage" indicates that sampling is done in several steps. First larger sampling units are selected then smaller sampling units are selected within the selected larger units.

3.1 Stage 1

KP consists of 25 districts. Districts are chosen at this level based on their HDI-Human Development Index rankings. A composite statistic called the Human Development Index (HDI) is used to classify regions into developed (high development), developing (medium development), and underdeveloped (low development) areas. The statistic is made up of information gathered at the national level on life expectancy, education, and per-capita GNI (as a measure of standard of living). The HDI ranked

districts have been divided into three groups and selected four districts from each group using simple random sampling. The selected districts are Mardan, Malakand, Swabi, Haripur, Peshawar, Charsadda, Karak, Bannu, Buner, Upper Dir, Tank and Battagram.

3.2 Stage 2

Thus, a random sample of size 400 is considered for this study. As there are different number of total tehsils in each selected district so in this stage, probability proportional sampling is used to select sample size from each selected district. The sample is distributed proportionally between 12 districts.

3.3 Stage 3

In this stage, the respondents are selected by using purposive sampling as it is difficult to perform simple random sampling for household data. By purposive sampling using is exclusion/ inclusion criteria. In this way data is collected from respondents according by keeping controlled variables e.g., gender and locality (urban/rural) etc.

4. Data analysis

A pilot study was done to assess the questionnaire's reliability. The test used a sample of 60 people from the general population. The alpha value for all variables was high after the reliability test. The final results reveal that all of the scales employed in this study have alpha values that are acceptable.

Table 4.1: *Pilot Testing of Questionnaire (N=60)*

Variables	No. of items	Alpha Value
Health Information	14	0.861
Vulnerability	3	0.820
Perceived Barrier	4	0.670
Severity of Health Issue	4	0.749
Perceived Benefits	5	0.832
Attitude towards Health Information	7	0.803
Influence of Indirect channels of communication	9	0.925

4.2 Descriptive Statistics

Table 4.2: *Demographic Characteristics of Respondents*

Demographics	Categories	Frequency	Percent
Age	18-24	17	4.30%
	25-31	126	31.50%
	32-38	176	44%
	39-45	65	16%
	45 and above	16	4%
Gender	Male	361	90.30%
	Female	39	9.80%
Location	Urban	214	53.50%
	Rural	186	46.50%
Marital Status	Married	268	67%
	Unmarried	132	33%

Table 4.2 shows the demographic characteristics of respondents. The subjects were divided into five age categories. The data displays that 4.3% of the total respondents are between age group 18-24, 31%, are between 25-31 age group, 39% are in between age 32-38, 22% in age 39-45, 3.8% of the respondents are in age 45 and above. The maximum respondents fall in the age group of 32-38 (n=156) and 25-31 (n=124) and the minimum is in age 45 and above (n=15) of the sample population. The gender wise distribution of the data has also been presented in the table 5.3. There were 362 males (90.5%) and 38 females (9.5 %) who participated in this study. Location wise, a total of 214 (53.5%) respondents were from urban and 186 (46.5%) from rural area. Moreover, in the total responses collected, 268 (67%) respondents were married and 132 (33%) were unmarried.

4.3 Convergent Validity

For each construct, the average variable extracted (AVE) is determined, as indicated in Table 4.3 It is suggested that all constructions have an AVE value greater than 0.50. As a result, we can confidently state that construct validity has been achieved. The construct must have an average score of better than 0.40 and composite reliability of greater than 0.60 to remain valid (Lam, 2012). As a result, AVE values greater than 0.40 suggest that construct are internally uni-directional, uni-factorial, and highly related to each other in order to explain the variable. As a result, these figures indicate that each variable item is convergent, implying that each item accurately represents the variable.

Table 4.3: *Convergent Validity of Variables*

	Cronbach's Alpha	rho _A	Composite Reliability	Average Variance Extracted (AVE)
Health Information	0.90	0.90	0.91	0.55
Indirect Channel of Communication	0.97	0.98	0.97	0.87
Perceived Benefits	0.83	0.84	0.87	0.58
Perceived Barrier	0.70	0.81	0.81	0.59
Attitude towards health Information	0.75	0.85	0.82	0.50
Severity of Health Issues	0.70	0.86	0.82	0.62
Vulnerability	0.81	0.84	0.89	0.73

4.4 Discriminant Validity

Table 4.4: *Fornell-Larcker Criterion of Variables*

	Health Infor matio n	Indirect Channel of Communica tion	Percei ved Benefi ts	Percei ved Barrie r	Attitude towards health Information	Severity of Health Issues	Vul nera bilit y
Health Information	0.74						
Indirect Channel of Communica tion	0.08	0.9					
Perceived Benefits	-0.09	-0.0	0.76				
Perceived Barrier	0.11	-0.0	0.01	0.77			
Attitude towards health					0.70		
Information Severity of	0.12	0.25	-0.00	-0.09			
	0.10	0.16	-0.04	0.08	0.15	0.78	

Health
Issues

Vulnerabilit y	-0.08	-0.01	0.60	0.02	0.02	-0.04	0.85
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The discriminant validity of the constructs is shown in table 4.4. Each separate construct should not have a strong relationship or association with the other constructs in the study (Agarwal & Karahanna, 2000). The square root of AVE is used to determine discriminant validity. When the AVE square root of each variable is greater than the inter-item correlation of another construct, discriminant validity is obtained. The discriminant validity of each variable is higher than the inter item correlation of other valuables, as shown.

*Table 4.5: Campaigns Experienced Frequently * Districts Cross Tabulation*

		health communication campaign experienced on social media most frequently			
		Corona Virus (Covid-19)	Sehat Sahulat Program	Integrated Vector Control Program	Total
District	Mardan	47	07	01	55
	Malakand	17	03	00	20
	Swabi	33	07	00	40
	Haripur	31	04	02	37
	Peshawar	66	15	02	83
	Charsadda	28	06	01	35
	Karak	14	01	00	15
	Bannu	20	04	01	25
	Buner	21	04	01	26
	Upper Dir	24	05	00	29
	Tank	16	01	00	17
	Battagram	16	01	01	18
	Total	333	58	09	400

In this table 4.5, the location of the respondents has been presented. A total of 333 respondents experience Corona Virus (Covid-19) most frequently on social media followed by Sehat Sahulat Program with 58 respondents' and 9 experience Integrated Vector Control Program.

Table 4.6: *Pearson Correlation Analysis (Exposure to Social Media with Other Variables)*

	Mean	SD	1	2	3	4	5	6	7	8
1. No of posts	--	--	1							
2. Time spent social media	--	--	-0.02	1						
3. Vulnerability	4.003	0.319	0.05	0.04	1					
4. Health Information	4.073	0.281	0.08	0.01	.13**	1				
5. Perceived Barrier	3.965	0.265	0.04	-0.04	.54**	.115*	1			
6. Severity of Health issue	4.121	0.283	-0.001	0.09	.23**	.150**	.15**	1		
7. Perceived Benefits	4.020	0.578	0.002	0.01	-0.07	-0.06	0.03	-0.05	1	
8. Attitude toward health information	4.042	0.282	0.019	0.09	-0.01	.16**	-0.05	.17**	0	1

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Table 4.6 shows correlation between the exposure to social media content (no of campaign posts seen on social media and hours spent using social media” with all of the variables considered in this study. The result shows that there is no significant correlation of the exposure to social media with all of the variables.

Influence of Indirect Channels	Urban	4.17	0.36	0.31	.573	0.25	398	.799	-.009	.036	-.081	.063
	Rural	4.18	0.37									
Attitude towards Health Information	Urban	4.02	0.26	0.40	.066	-0.17	398	.239	-.033	.028	-.088	.022
	Rural	4.06	0.30									

An independent-samples t-test was conducted to compare the Health information for urban and rural. There were insignificant differences ($t(df) = 398, p = .982$) in scores for urban ($M = 4.0731$ $SD = .28809$) and rural ($M = 4.0737$ $SD = .27488$). The magnitude of the differences in the means (mean difference = $-.00064$, 95% CI: $-.05622$ to $.05495$) was very small.

To compare the vulnerability for urban and rural there were insignificant differences ($t(df) = 398, p = .687$) in scores for urban ($M = 4.0093$ $SD = .33084$) and rural ($M = 3.9964$ $SD = .30607$). The magnitude of the differences in the means (mean difference = $.01293$, 95% CI: $-.05005$ to $.07591$) was very small.

To compare the perceived barrier for urban and rural there were insignificant differences ($t(df) = 398, p = .968$) in scores for urban ($M = 3.9661$ $SD = .27465$) and rural ($M = 3.9651$ $SD = .25625$). The magnitude of the differences in the means (mean difference = $.00107$, 95% CI: $-.05141$ to $.05354$) was very small.

To compare the perceived benefits for urban and rural. There were insignificant differences ($t(df) = 398, p = .490$) in scores for urban ($M = 4.0019$ $SD = .56001$) and rural ($M = 4.0419$ $SD = .59925$). The magnitude of the differences in the means (mean difference = $-.04007$, 95% CI: $-.15409$ to $.07396$) was very small.

To compare the Severity of Health issues for urban and rural. There were insignificant differences ($t(df) = 398, p = .179$) in scores for [Urban] ($M = 4.1390$ $SD = .30873$) and rural ($M = 4.1008$ $SD = .25119$). The magnitude of the differences in the means (mean difference = $.03821$, 95% CI: $-.01765$ to $.09407$) was very small.

To compare the influence of indirect channels for urban and rural. There were insignificant differences ($t(df) = 398, p = .799$) in scores for urban ($M = 4.1776$ $SD = .36332$) and rural ($M = 4.1870$ $SD = .37384$). The magnitude of the differences in the means (mean difference = $-.00941$, 95% CI: $-.08198$ to $.06317$) was very small.

To compare the attitude towards health information for urban and rural, there were insignificant differences ($t(df) = 398, p = .239$) in scores for urban ($M = 4.0274$ $SD = .26286$)

and rural ($M = 4.0607$ $SD = .30249$). The magnitude of the differences in the means (mean difference = $-.03331$, 95% CI: $-.08888$ to $.02226$) was very small.

Table 4.8: *Independent Sample T-Test with regard to Gender*

	Gen der	Me an	S D	Levene's Test for Equality of Variance s		t-test for Equality of Means						
				F	Sig. .	t	df	Sig. (2- tail ed)	Mean Differ ence	Std. Error Differ ence	95% Confidenc e Interval of the Difference	
											Low er	Up per
Health Informat ion	Mal e	4.0 6	0. 27	8.1 1	.0 05	- 2.6 67	3 9 8	.00 8	-.125	.047	-	-.033
	Fem ale	4.1 8	0. 33								.2 18	.4 59
Vulnera bility	Mal e	4.0 0	0. 32	1.1 3	.2 88	- .4 59	3 9 8	.64 7	-.024	.053	-	.081
	Fem ale	4.0 2	0. 23								.9 00	.1 01
Perceive d Barrier	Mal e	3.9 6	0. 27	0.0 00	.9 91	.1 01	3 9 8	.92 0	.004	.044	-	.092
	Fem ale	3.9 6	0. 22								.1 66	.1 17
Perceive d Benefits	Mal e	4.0 1	0. 58	1.9 2	.1 66	- .1 17	3 9 8	.90 7	-.011	.097	-	.180
	Fem ale	4.0 3	0. 47								.8 66	.5 81
Severity of Health Issues	Mal e	4.1 2	0. 28	0.0 2	.8 66	.5 81	3 9 8	.56 2	.027	.047	-	.121
	Fem ale	4.0 9	0. 29								.4 5	.1 46
Influenc e of	Mal e	4.1 8	0. 36	0.4 5	.1 46	.88 4	.009	.062	.131			

Indirect Channels	Female	4.17	0.40	.50	.2	39						
Attitude towards Health Information	Male	4.04	0.28	0.19	.60	-39	.845	-.009	.047	-.102	.084	
	Female	4.05	0.25	0.16	.96	88						

An independent-samples t-test was conducted to compare the health information for male and female. There are significant differences ($t(df) = 398, p = .008$) in scores for male ($M = 4.0611$ $SD = .27336$) and females ($M = 4.1868$ $SD = .33246$). The magnitude of the differences in the means (mean difference = $-.12567$, 95% CI: $-.21830$ to $-.03304$) was significant. Hence, hypothesis was supported.

To compare the Vulnerability for male and females. There were insignificant differences ($t(df) = 398, p = .647$) in scores for male ($M = 4.0009$ $SD = .32726$) and females ($M = 4.0256$ $SD = .23427$). The magnitude of the differences in the means (mean difference = $-.02472$, 95% CI: $-.13061$ to $.08117$) was very small.

To compare the perceived barrier for male and females. There were insignificant differences ($t(df) = 398, p = .920$) in scores for male ($M = 3.9661$ $SD = .27014$) and female ($M = 3.9615$ $SD = .22608$). The magnitude of the differences in the means (mean difference = $.00453$, 95% CI: $-.08370$ to $.09276$) was very small.

To compare the perceived benefits for male and females. There were insignificant differences ($t(df) = 398, p = .907$) in scores for male ($M = 4.0194$ $SD = .58912$) and female ($M = 4.0308$ $SD = .47137$). The magnitude of the differences in the means (mean difference = $-.01138$, 95% CI: $-.20321$ to $.18046$) was very small.

To compare the severity of health issues for male and females. There were insignificant differences ($t(df) = 398, p = .562$) in scores for male ($M = 4.1240$ $SD = .28267$) and female ($M = 4.0962$ $SD = .29589$). The magnitude of the differences in the means (mean difference = $.02781$, 95% CI: $-.06629$ to $.12190$) was very small.

To compare the influence of indirect channels for male and females. There were insignificant differences ($t(df) = 398, p = .884$) in scores for male ($M = 4.1828$ $SD = .36461$) and female ($M = 4.1738$ $SD = .40126$). The magnitude of the differences in the means (mean difference = $.00904$, 95% CI: $-.11300$ to $.13107$) was very small.

To compare the attitude towards health information for male and females. There were insignificant differences ($t(df) = 398, p = .845$) in scores for male ($M = 4.0419$ $SD = .28521$) and female ($M = 4.0513$ $SD = .25489$). The magnitude of the differences in the means (mean difference = $-.00934$, 95% CI: $-.10293$ to $.08426$) was very small.

Table 1: *One-way ANOVA with regard to Time Spend Using Social Media*

	Time Spend Using Social Media	Mean	S D	Test of Homogeneity of Variances	ANOVA		
				Levene's Statistics	Signif.	F	Signif.
Vulnerability	0-1 hour	4.05	.274	6.04	.000	1.09	.363
	1-2 hours	4.05	.237				
	2-3 hours	4.11	.370				
	3-4 hours	4.11	.303				
	4-5 hours	4.03	.264				
	Above 5 hours	4.05	.183				
Health Information	0-1 hour	3.95	.291	5.32	.000	5.81	.000
	1-2 hours	3.95	.274				
	2-3 hours	4.09	.307				
	3-4 hours	4.12	.419				
	4-5 hours	3.86	.276				
	Above 5 hours	4.03	.302				
Perceived Barrier	0-1 hour	3.94	.103	3.27	.007	7.11	.000
	1-2 hours	3.94	.295				
	2-3 hours	4.03	.250				
	3-4 hours	4.08	.253				
	4-5 hours	3.84	.243				
	Above 5 hours	3.86	.257				

Information

1-2 hours	4.03	.2 25
2-3 hours	4.18	.3 56
3-4 hours	4.13	.2 54
4-5 hours	3.92	.2 72
Above 5 hours	4.03	.1 <u>11</u>

The One-way ANOVA results suggest that the vulnerability scores of the groups differ significantly ($p < .05$).

The One-way ANOVA results suggest that the health information scores of the groups differ significantly ($p < .05$).

Since the Levene's Statistic is significant, the equal variance was not assumed. To check for individual differences between groups post-hoc comparisons were assessed using Dunnett's T3. The test indicated that the mean score for respondents with time spent 1-2 hours ($M = 3.9566$, $SD = .27477$) was significantly different from 2-3 hours ($M = 4.0965$, $SD = .30703$). 2-3 hours ($M = 4.0965$, $SD = .30703$) differed significantly from 4-5 hours ($M = 3.8696$, $SD = .27647$). 3-4 hours ($M = 4.1243$, $SD = .41935$) differed significantly 4-5 hours ($M = 3.8696$, $SD = .27647$). The mean differences were significant at the 0.05 level. However, no significant differences were detected between other groups.

The One-way ANOVA results suggest that the perceived barrier scores of the groups differ significantly ($p < .05$).

Since the Levene's Statistic is significant, the equal variance was not assumed. To check for individual differences between groups post-hoc comparisons were assessed using Dunnett's T3. The test indicated that the mean score for respondents with time spent 0-1 hours ($M = 4.0578$, $SD = .27448$) was significantly different from 1-2 hours ($M = 4.0528$, $SD = .23713$) 2-3 hours ($M = 4.1175$, $SD = .37009$). 2-3 hours ($M = 4.1175$, $SD = .37009$) differed significantly 4-5 hours ($M = 4.0326$, $SD = .26458$). 3-4 hours ($M = 4.1199$, $SD = .30346$) differed significantly 4-5 hours ($M = 4.0326$, $SD = .26458$). The mean differences were significant at the 0.05 level. However, no significant differences were detected between other groups.

The One-way ANOVA results suggest that the severity of health issues scores of the groups differ significantly ($p < .05$).

Since the Levene's Statistic is significant, the equal variance was not assumed. To check for individual differences between groups post-hoc comparisons were assessed using Dunnett's T3. The test indicated that the mean score for respondents with time spent 0-1 hours ($M = 4.0578$, $SD = .24954$) was significantly different from 3-4 hours ($M = 4.0528$, $SD = .34740$). 1-2 hours ($M = 4.0514$, $SD = .23713$) differed significantly from 2-3 hours ($M = 4.0745$, $SD = .37615$) and 3-4 hours ($M = 4.2500$, $SD = .34740$). 2-3 hours ($M = 4.2368$, $SD = .37615$) differed significantly 4-5 hours ($M = 4.0326$, $SD = .26458$). 3-4 hours ($M = 4.1199$, $SD = .30346$) differed significantly 4-5 hours ($M = 4.0272$, $SD = .12051$). The mean differences were significant at the 0.05 level. However, no significant differences were detected between other groups.

The One-way ANOVA results suggest that the perceived benefits score of the groups do not differ significantly ($p > .05$).

The One-way ANOVA results suggest that the influence of indirect channels scores of the groups do not differ significantly ($p < .05$).

The One-way ANOVA results suggest that the attitude towards health information scores of the groups differ significantly ($p < .05$).

Since the Levene's Statistic is significant, the equal variance was not assumed. To check for individual differences between groups post-hoc comparisons were assessed using Dunnett's T3. The test indicated that the mean score for respondents with time spent 0-1 hours ($M = 3.8328$, $SD = .24801$) was significantly different from 1-2 hours ($M = 4.0372$, $SD = .22513$), 2-3 hours ($M = 4.1805$, $SD = .35638$), 3-4 hours ($M = 4.1380$, $SD = .25440$) and above 5 hours ($M = 4.0385$, $SD = .11108$). 1-2 hours ($M = 4.0372$, $SD = .22513$) differed significantly from 2-3 hours ($M = 4.1805$, $SD = .35638$). 2-3 hours ($M = 4.1805$, $SD = .35638$) differed significantly 4-5 hours ($M = 3.9286$, $SD = .27230$). 3-4 hours ($M = 4.1380$, $SD = .25440$) differed significantly 4-5 hours ($M = 3.9286$, $SD = .27230$). The mean differences were significant at the 0.05 level. However, no significant differences were detected between other groups.

5. Discussion

In light of the numerous gaps in the literature, this study examined various facets of the theoretical foundation borrowed from Health Belief Model. These factors have never been considered in the context of Pakistan. As a result, there is a lack of literature to substantiate the research findings. However, those that are available have been referenced in conjunction with the study's various findings. As such, this study serves as a baseline for future research in this domain. The study discovered that respondents use social media to learn about the most prevalent health issues in their communities via various health campaigns. The respondents identified anti-covid-19 campaigns and the Sehat Sahulat program as the most frequently viewed on social media.

Social media's affordability and reach enable it to play a critical role in enhancing people's behaviours, beliefs, and attitudes toward health information. Health indicators were assumed to be substandard in the various districts of Khyber Pakhtunkhwa where this study was conducted.

The study's first research question examined the demographic differences between respondents in terms of health information, vulnerability, and the severity of health issues, perceived benefits, perceived barriers, attitude toward health information, and the influence of indirect channels of communication. The independent sample t-test indicates that respondents do not differ by setting (urban vs. rural) in terms of the variables mentioned above.

Additionally, respondents differed by gender when it came to health information but not when it came to other variables (vulnerability, severity of health issues, perceived benefits, perceived barriers, attitude towards health information and influence of indirect channels of communication). When respondents were classified according to their marital status, they did not differ in terms of constructs (health, information, vulnerability, severity of health issues, perceived benefits, perceived barriers, and attitude toward health information), but they did differ in terms of the influence of indirect channels of communication.

The one-way ANOVA indicates that age groups have significantly different vulnerability and influence of indirect channels scores. In terms of education levels, the results indicate that health information scores differ significantly across different education levels. The same is true for vulnerability scores across significantly different income levels. Similarly, the results indicate that the groups' health information scores differ significantly in terms of the number of social media posts viewed. Additionally, the results indicate that the groups' health information, perceived barrier, and attitude toward health information scores vary significantly according to the social media tool used to acquire health campaign information.

Additionally, the findings indicate that the groups' health information, perceived barrier, severity of health issues, and attitude toward health information scores differ significantly in relation to the amount of time spent on social media. With regards to the various social media campaigns, the results indicate that the groups' scores on health information and attitude toward health information are significantly different. These results correspond those of (McFarland, 2013), who found no significant relationships between all demographic variables and components of the Health Belief Model constructs in this sample of mostly long-term Gaborone residents.

Nowak et al., (2020) suggests that structural and demographic variables can influence an individual's perception. Demographic factors such as gender, age, and educational attainment all play a significant role in promoting health motivation. These findings indicate that people in different countries respond differently to social media-based health campaigns.

6. Conclusion

This study adds to the body of knowledge on the use of social media to communicate public health messages. Through the application of three distinct theoretical perspectives, this study established a solid foundation for future research in the field of health communication. The twelve districts of Pakistan's Khyber Pakhtunkhwa Province were examined in this study to determine the potential impact of health communication campaigns. The impact was assessed in terms of health beliefs.

In the first instance, an informative systematic review of the literature was conducted, which provided a high-level overview of what is known about this subject, including the identification of evidence gaps. There were no systematic reviews available for the social media campaigns that were the subject of this study. A search of the literature was conducted for all variables mentioned in this study, as well as for studies conducted in other countries in the same domain. This literature review provides extensive information on health campaigns, social media, social media and health campaigns, the impact of health campaigns, evaluating health campaigns, the impact of social ties on the public, and Khyber Pakhtunkhwa's health indicators. Additionally, this study included details on the theoretical underpinnings of health campaign research. This was included to add evidence to the various theoretical perspectives on campaign characteristics.

Other findings indicate that the use of social media platforms can have a beneficial effect on public awareness. Public health authorities may be able to effectively use social media platforms to raise public health awareness by disseminating brief messages to targeted populations. However, additional research is needed to validate how social media channels can be used to increase health literacy and healthy behavior adoption in a cross-cultural setting in Pakistan.

While each of these campaigns had its own impact on users, the indirect channels of communication also played a significant role. Additionally, users are influenced by the information shared by peers, coworkers, and parents via various social media tools. This increases their awareness of health-related issues.

The users were classified into various demographic segments, and any discrepancies in their perceptions of the various variables examined in this study were examined. Several of the results from the independent sample t-test and one-way ANOVA indicated that some respondents differed, while others did not. The results of the post-hoc tests, which are included in the appendix, explain the differences.

Social media platforms can bolster health professionals' counseling abilities, empower users to educate themselves about their conditions, and advance health care equity. Social media interventions have been shown to be effective in vulnerable populations, such as low-income sectors, rural areas, and minority ethnic groups. Social media platforms are important sources of information for policymakers (Sinnenberg et.al., 2017).

Due to the fact that these communication channels are updated on a regular basis, they provide up-to-date indicators for health policy analysis and action. Text, images, videos, locations, and social networks can be used for public health surveillance, optimizing policy interventions, identifying geographically vulnerable groups in need of resource allocation, and designing policies that take into account how individuals interact within communities (Yeung, 2011). Taking these contributions into account, social media platforms are effective tools for health education that people of all ages can use on a daily basis to learn and share knowledge (Volpp & Mohta, 2017).

According to the Health Belief Model (HBM), a person carries out health-related behavior based on his/her perceived vulnerability and severity, benefits and barriers of the health issue. We found that demographics and social media exposure did not significantly correlate with perceived vulnerability or severity of health issues; however, we found that attitudes towards health information differed significantly by gender. This indicates that although the HBM is a valuable framework for evaluating health beliefs, some aspects of social media engagement and individual characteristics may be more influential in determining health behavior. These results suggest that health campaigns should provide information but also target perceived barriers to high use of testing and self-efficacy to use testing, with the aim of removing the threshold to more active management of health.

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Appendix 1:

Table 1: *Post Hoc for Health Information across Time Spent Using Social Media*

Multiple Comparisons						
Dependent Variable: Health Information						
Dunnnett T3						
(I) time spent social media	(J) time spent social media	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
0-1 hour	1-2 hours	.00083	.04825	1.000	-.1449	.1465
	2-3 hours	-.13904	.05524	.179	-.3044	.0264
	3-4 hours	-.16685	.06922	.230	-.3741	.0404
	4-5 hours	.08788	.05893	.882	-.0890	.2648
	Above 5 hours	-.08101	.07308	.987	-.3050	.1430
1-2 hours	0-1 hour	-.00083	.04825	1.000	-.1465	.1449
	2-3 hours	-.13987*	.04192	.016	-.2647	-.0151
	3-4 hours	-.16767	.05914	.082	-.3459	.0106
	4-5 hours	.08706	.04668	.621	-.0538	.2279
	Above 5 hours	-.08184	.06362	.952	-.2816	.1179
2-3 hours	0-1 hour	.13904	.05524	.179	-.0264	.3044
	1-2 hours	.13987*	.04192	.016	.0151	.2647
	3-4 hours	-.02780	.06497	1.000	-.2223	.1667
	4-5 hours	.22693*	.05387	.001	.0657	.3882
	Above 5 hours	.05803	.06907	.999	-.1550	.2711
3-4 hours	0-1 hour	.16685	.06922	.230	-.0404	.3741
	1-2 hours	.16767	.05914	.082	-.0106	.3459
	2-3 hours	.02780	.06497	1.000	-.1667	.2223
	4-5 hours	.25473*	.06813	.005	.0507	.4588
	Above 5 hours	.08583	.08069	.992	-.1589	.3305
4-5 hours	0-1 hour	-.08788	.05893	.882	-.2648	.0890
	1-2 hours	-.08706	.04668	.621	-.2279	.0538
	2-3 hours	-.22693*	.05387	.001	-.3882	-.0657
	3-4 hours	-.25473*	.06813	.005	-.4588	-.0507
	Above 5 hours	-.16890	.07206	.282	-.3901	.0523
Above 5 hours	0-1 hour	.08101	.07308	.987	-.1430	.3050
	1-2 hours	.08184	.06362	.952	-.1179	.2816
	2-3 hours	-.05803	.06907	.999	-.2711	.1550
	3-4 hours	-.08583	.08069	.992	-.3305	.1589
	4-5 hours	.16890	.07206	.282	-.0523	.3901

*. The mean difference is significant at the 0.05 level.

Table 2: *Post Hoc for Perceived Barrier across Time Spent Using Social Media*

Multiple Comparisons						
Dependent Variable: Perceived Barrier						
Dunnett T3						
(I) time spent social media	(J) time spent social media	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
0-1 hour	1-2 hours	.00503	.02871	1.000	-.0800	.0901
	2-3 hours	-.08938	.03247	.098	-.1865	.0077
	3-4 hours	-.14217*	.03626	.003	-.2514	-.0330
	4-5 hours	.10442	.03895	.129	-.0140	.2229
	Above 5 hours	.08142	.05265	.841	-.0851	.2480
1-2 hours	0-1 hour	-.00503	.02871	1.000	-.0901	.0800
	2-3 hours	-.09440	.03773	.179	-.2063	.0175
	3-4 hours	-.14720*	.04103	.007	-.2696	-.0248
	4-5 hours	.09939	.04343	.302	-.0310	.2298
	Above 5 hours	.07640	.05604	.930	-.0979	.2507
2-3 hours	0-1 hour	.08938	.03247	.098	-.0077	.1865
	1-2 hours	.09440	.03773	.179	-.0175	.2063
	3-4 hours	-.05280	.04375	.977	-.1833	.0777
	4-5 hours	.19379*	.04601	.001	.0559	.3317
	Above 5 hours	.17080	.05806	.073	-.0086	.3502
3-4 hours	0-1 hour	.14217*	.03626	.003	.0330	.2514
	1-2 hours	.14720*	.04103	.007	.0248	.2696
	2-3 hours	.05280	.04375	.977	-.0777	.1833
	4-5 hours	.24659*	.04875	.000	.1005	.3927
	Above 5 hours	.22360*	.06026	.008	.0384	.4088
4-5 hours	0-1 hour	-.10442	.03895	.129	-.2229	.0140
	1-2 hours	-.09939	.04343	.302	-.2298	.0310
	2-3 hours	-.19379*	.04601	.001	-.3317	-.0559
	3-4 hours	-.24659*	.04875	.000	-.3927	-.1005
	Above 5 hours	-.02299	.06192	1.000	-.2128	.1668
Above 5 hours	0-1 hour	-.08142	.05265	.841	-.2480	.0851
	1-2 hours	-.07640	.05604	.930	-.2507	.0979
	2-3 hours	-.17080	.05806	.073	-.3502	.0086
	3-4 hours	-.22360*	.06026	.008	-.4088	-.0384
	4-5 hours	.02299	.06192	1.000	-.1668	.2128

*. The mean difference is significant at the 0.05 level.

Table 3: *Post Hoc for Severity of Health Issues across Time Spent Using Social Media*

Multiple Comparisons	
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 Dependent Variable: Severity of Health Issue
 Dunnett T3

(I) time spent social media	(J) time spent social media	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
0-1 hour	1-2 hours	.02310	.03965	1.000	-.0972	.1434
	2-3 hours	-.16237	.05645	.068	-.3308	.0061
	3-4 hours	-.17553*	.05806	.046	-.3493	-.0017
	4-5 hours	.04729	.04050	.981	-.0754	.1700
	Above 5 hours	-.06015	.07222	.999	-.2833	.1630
1-2 hours	0-1 hour	-.02310	.03965	1.000	-.1434	.0972
	2-3 hours	-.18547*	.04593	.002	-.3232	-.0478
	3-4 hours	-.19863*	.04789	.001	-.3433	-.0539
	4-5 hours	.02420	.02373	.995	-.0466	.0950
	Above 5 hours	-.08325	.06433	.949	-.2874	.1210
2-3 hours	0-1 hour	.16237	.05645	.068	-.0061	.3308
	1-2 hours	.18547*	.04593	.002	.0478	.3232
	3-4 hours	-.01316	.06251	1.000	-.1994	.1731
	4-5 hours	.20967*	.04666	.000	.0698	.3495
	Above 5 hours	.10223	.07584	.938	-.1300	.3345
3-4 hours	0-1 hour	.17553*	.05806	.046	.0017	.3493
	1-2 hours	.19863*	.04789	.001	.0539	.3433
	2-3 hours	.01316	.06251	1.000	-.1731	.1994
	4-5 hours	.22283*	.04859	.000	.0762	.3695
	Above 5 hours	.11538	.07705	.875	-.1203	.3511
4-5 hours	0-1 hour	-.04729	.04050	.981	-.1700	.0754
	1-2 hours	-.02420	.02373	.995	-.0950	.0466
	2-3 hours	-.20967*	.04666	.000	-.3495	-.0698
	3-4 hours	-.22283*	.04859	.000	-.3695	-.0762
	Above 5 hours	-.10744	.06486	.774	-.3128	.0979
Above 5 hours	0-1 hour	.06015	.07222	.999	-.1630	.2833
	1-2 hours	.08325	.06433	.949	-.1210	.2874
	2-3 hours	-.10223	.07584	.938	-.3345	.1300
	3-4 hours	-.11538	.07705	.875	-.3511	.1203
	4-5 hours	.10744	.06486	.774	-.0979	.3128

*. The mean difference is significant at the 0.05 level.

Table 4: *Post Hoc for Attitude towards Health Information across Time Spent Using Social Media*

Multiple Comparisons						
Dependent Variable: Attitude Toward Health Information						
Dunnnett T3						
(I) time spent social media	(J) time spent social media	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
0-1 hour	1-2 hours	-.20436*	.04069	.000	-.3273	-.0814
	2-3 hours	-.34762*	.05459	.000	-.5105	-.1847
	3-4 hours	-.30519*	.04905	.000	-.4521	-.1583
	4-5 hours	-.09574	.05404	.695	-.2580	.0666
	Above 5 hours	-.20563*	.04223	.000	-.3334	-.0778
1-2 hours	0-1 hour	.20436*	.04069	.000	.0814	.3273
	2-3 hours	-.14327*	.04492	.028	-.2776	-.0089
	3-4 hours	-.10083	.03800	.128	-.2148	.0131
	4-5 hours	.10861	.04426	.217	-.0256	.2428
	Above 5 hours	-.00128	.02867	1.000	-.0880	.0855
2-3 hours	0-1 hour	.34762*	.05459	.000	.1847	.5105
	1-2 hours	.14327*	.04492	.028	.0089	.2776
	3-4 hours	.04244	.05261	1.000	-.1143	.1992
	4-5 hours	.25188*	.05730	.000	.0807	.4230
	Above 5 hours	.14199*	.04632	.041	.0032	.2808
3-4 hours	0-1 hour	.30519*	.04905	.000	.1583	.4521
	1-2 hours	.10083	.03800	.128	-.0131	.2148
	2-3 hours	-.04244	.05261	1.000	-.1992	.1143
	4-5 hours	.20944*	.05205	.002	.0533	.3656
	Above 5 hours	.09955	.03964	.185	-.0197	.2189
4-5 hours	0-1 hour	.09574	.05404	.695	-.0666	.2580
	1-2 hours	-.10861	.04426	.217	-.2428	.0256
	2-3 hours	-.25188*	.05730	.000	-.4230	-.0807
	3-4 hours	-.20944*	.05205	.002	-.3656	-.0533
	Above 5 hours	-.10989	.04568	.241	-.2484	.0286
Above 5 hours	0-1 hour	.20563*	.04223	.000	.0778	.3334
	1-2 hours	.00128	.02867	1.000	-.0855	.0880
	2-3 hours	-.14199*	.04632	.041	-.2808	-.0032
	3-4 hours	-.09955	.03964	.185	-.2189	.0197
	4-5 hours	.10989	.04568	.241	-.0286	.2484

*. The mean difference is significant at the 0.05 level.