



## Perceived Usefulness and Effects of Online Health Information among Users amid Covid19; Is there any role of demographics?

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### Abstract

Since March 11, 2020, when WHO declared Covid19 as a worldwide pandemic, a drastic change in the lives of individuals and nations can be witnessed. The constrained mobility and restricted capacity of local governments in providing health care services resulted as an increased dependence of people on alternate sources of information and guidance regarding their health. This has transformed the ways people take care of their health and make health related decisions for themselves or their dear ones. This article contributes to the growing body of research on new media by exploring the role of internet as a source of health information, specifically through the lens of Uses and gratification and Dependency theory. A questionnaire-based online survey collected data from users belonging to different age and income groups regarding needs, perceived usefulness and cyberchondric effects of OHI among them. Findings revealed websites and discussion forums as to be most extensively used sources of OHI followed by Facebook and YouTube. To get information and updates of Covid19, to take precautionary measures for Covid19 and to check for the symptoms of Covid19 were reported as major needs by the users. The ratio of the usage of internet for health-related information about health issues other than Covid19 was also significantly higher. To avoid in person, visit to physician, ubiquity, and quick and easy retrieval of information from divers' sources were the reported reasons for this increased usage. Results demonstrate that during Covid19, both the usage of internet as an alternative source of HI needs and its perceived usefulness was significantly higher. Statistical analysis revealed difference in perceived usefulness of OHI during Covid19 due to gender, income, education and health status of the respondents. Similarly, the study revealed a strong positive relationship between Usage and Perceived usefulness of OHI. The strong relationship between Usage and psychological effect show ever was found to marginalize the significance of OHI.

**Keywords:** E-Online health information (OHI), Health information source (HIS), Perceived Usefulness, Cyberchondric effects

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## 1) INTRODUCTION

Crisis and human life are indivisible and with the passage of time, despite all developments, the nature and intensity of crisis is increasing. The increased dependence of people on media during crisis is also an established fact (Mitomo et al., 2012; Longstaff, 2005 & Ball-Rokeach, 1985). Different forms of communication come to be more visible during crisis like situations, not only for disseminating information, but also for connecting with others whether directly or remotely. In situations like Covid19, which are considered as a menace for public health there is an increased tendency among public to set up protection actions (Garfin et al., 2020). Ultimately their interest in seeking information and guidance as to the way they should act also increases, which results enhanced media consumption and exposure (Morton & Duck, 2001). Another reason for this increased dependence on media is confusion caused by situations like pandemic and natural disasters among people, particularly when they have trust issue with information provided by the main stream media. In such situations, internet become a source for alternative information and emotional support for them (Miura et al., 2014; Slater et al., 2012; Shimada & Seike, 2013), resulting in increased dependency on media at both micro and macro levels. This tendency to use internet as a source of information has reported to be greater among social media users than non-users (Jung, 2012). In given circumstances, not only the dependence increases, rather the new needs are also created by situation. Media thus is approached with the expectation to gratify the crisis-specific needs, beside the fulfillment of the already existing needs of users. Predominantly, the informational needs and guidance regarding the decisions about the actions to be taken in that specific situation, including health related issues, are on an increase. For the gratification of these needs, media consumption and exposure are enhanced (Morton & Duck 2001). It is important to consider the perceived dependency of user on a particular media, when the role of that particular medium is being studied because it has been identified as a predictor which strongly affects the usage and determined the trust of that particular medium (Cheng et al., 2014).

While Corona virus outbreak drove many commercial and social activities online, the scholarly interest in studying the needs, consumptions and usefulness of this new phenomenon has also been augmented. Researchers have focused the role of internet for academic/educational and professional activities among users with diversified socio-economic background and an overall positive view of the internet has been shared by majority. According to the findings of Pew internet survey, during the pandemic, internet has been reported as an essential and important tool and its impacts are being reported positive for both the individuals and society by majority of the people (Vogels et al., 2020).

However, the role internet is playing as a source of information and guidance regarding Covid19 in specific and health related issues in general is an unaddressed aspect of studies on new media. During the outbreak and specifically during lock downs people faced issues like restricted mobility, fear of visiting public hospitals and a limited or non-availability of medical facilities and professionals. Particularly those with chronic illness were advised to avoid visiting a hospital unless and until it was absolutely emergent and crucial. In given circumstances people had to turn

toward alternative sources of information. Since all could not possibly have medical professional in their personal contacts, the dependence in internet as an information source and seeking guidance increased, which has already been recognized as a popular and useful health information source(HIS) among users(Cotton & Gupta, 2004).It provides both Preventive health information(PHI) and Curative health information(CHI),particularly to those who are in pressing need of information and advice on common health solutions and emotional support to deal with health and medical issues they face in their routine life (Fox, 2014).

Easy access and huge amount of health- related information from diverse sources, however, may result in certain psychological impacts on users such as Cyberchondria which refers to the tendency to persistently checking the Internet sources for health-related information about conditions you fear you might have. The probability increases during spread of contagious disease like Covid19 where every individual has the threat of being infected. The diligent research turns into an obsession which may affect their psychological well-being. The study therefore also intends to explore that if the increased dependence on OHI and exposure to pandemic related information, which people consider as useful, is also having any underlying psychological effects on them.

## **2)LITERATURE REVIEW**

Due to technological advancements, online sources have acquired the status of most reachable health information sources by the public Bujnowska-Fedak et al., 2019; Beck et al., 2014). The results of the studies by Radonjic et al. (2020) & Madathil et al. (2015) indicated that social media and online platforms are the major sources of medical information for many people. The ways health information is spread in unusual situations like disease pandemics is of vital importance and there is an increased trend to study this phenomenon (Khatri et al.,2020;Baschet al., 2020).

Researchers have been interested in identifying the motivations and needs which drive the consumption of media in crisis and disasters and ability of media to fulfill the expectations of their audience. Panagopoulos (2014) for example, analyzed the consumption patterns of the social media during a series of crisis events. Based on the Uses and gratification theory, the study found that social media users are given more freedom and have more control over their usage of media during crisis to fulfill their specific needs, like informational needs and psychological needs. Some studies have specifically focused the role of media in crisis like flood, when the services of mainstream media were suspended due to crisis (Aishaa et al., 2015). Bartos (2017) explored how people used Twitter during the wildfire event in Gatlinburg, Tennessee, specifically, focusing what did people share from different geo locations on Twitter and what gratification they got from their use of Twitter. A content analysis was done through stratified sampling of Tweets which were separated according to the locations. Considering the uses and gratification as a base, the tweets were coded as informational, social, and/or distractive. The findings discovered that people receive social connection from using Twitter during a crisis. Higher dependence on media in crisis like pandemics raises the question of reliability of the content and trust of information among users. This concern becomes more

significant with reference to social media where a significant portion of the content is user-generated and is not peer-reviewed. Atac et al. (2020) conducted a comparative analysis of the content of YouTube videos in their national language (i.e. Turkish) with the content of videos in English language which were most frequently watched during Covid19. The objective of their research was to compare the reliability of the videos. Researchers used specifically designed scales DISCERN and MICI to evaluate the content and credibility of selected videos and found only 37.5% of the reviewed videos (in both languages) having useful content and a higher proportion of misleading content in Turkish videos than English videos. In a similar study, which compared Mandarin (Chinese) and English language YouTube videos on Covid19, Khatria et al. (2020) though found a higher no. of useful videos in both languages as compared to the. However, the videos containing misleading information were viewed by more than the useful ones. None of the above discussed studies found a notable no. of useful YouTube videos uploaded by professional health organizations like WHO. In fact, Atac et al. (2020) did not find a single video. The researchers identified YouTube as an important platform for information dissemination due to its higher viewership during 2019 Covid19 outbreak than previous outbreaks.

Trust in information source is another significant yet critical aspect of crisis studies. Because on one hand it is a motivating factor that help users to decide their preferred source of health-related information (Rains, 2007) and thus affects their consumption of media and on the other hand it has been found a significant determining factor of the usefulness of information. Researchers therefore have also focused the "Trust" construct in the context of crisis. Hagar (2013) highlighted key concern in the emerging field of crisis informatics i.e. trust concerns regarding information in the crisis or disasters. He examined that how the unchecked nature of social media influences the dissemination of information. Deciding what source of information is credible, and which information providers are trustworthy during crisis is significant because it shape the nature of the crisis. Findings revealed social media to be an influential tool not only for sharing facts in crisis but also helped to improve emergency management capabilities. However, it also has the power to mislead and misinform the users.

Comparison of new media and traditional media as information source during crisis has also been studied. Spence et al. (2007) explored the relationship between socio demographic i.e. age and gender and information seeking behaviors, after the 9/11 terroristic attack. Data was obtained from three different US geographic areas for their survey-based study which showed that males reported internet as a useful information source whereas traditional mass media was considered more useful by female users. Age differences were also found in the use of print media and internet. The studies on the uses and gratification's foundation have mostly focused different aspects such as subscriptions to premium streaming service's perceived usefulness and ease of use (Camilleri & Falzon, 2020), how online apps served individuals to monitor unexpected scenario of COVID-19, relax social tensions that arose from a health emergency and pass the spare time during the outbreak (Basu & Gharami, 2021), sharing content related to pandemic on WhatsApp and how online customers respond in terms of perceived benefits to their shopping behaviour during Covid-19 (Pham et al., 2020). Other researchers have focused on the crisis-specific informational needs of the users, the comparison of the content of specific online

sources like YouTube, WhatsApp and Twitter, the positive and negative role of media in disaster management and comparison of traditional and new media during crisis. The use of internet as health information source (HIS) and the effects of exposure to information related to crisis, specially disease outbreak has remained an unaddressed so far. Therefore, this study aims to,

- Explore the needs for the usage of OHI during pandemic Covid19.
- Examine the perceived usefulness of OHI during pandemic Covid19 among users with diverse demographics.
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- Analyze the effects of the use of information during Covid19.

## 2.1 Hypothesis

**H1:** There will be association between the use of internet and Perceived usefulness of OHI.

**H2:** The relationship between use of internet and perceived usefulness will vary among users due to socio demographics.

## 2.2 Research Questions

RQ1. Does increased dependence and usage of OHI during crisis like Covid19 causes psychological effects on users?

RQ2. Is there any association between Usage and Psychological effects caused by exposure to OHI?

## 2.3 Population of the study

Population of this study comprised of those users who utilize online sources to seek health related information for themselves or their dear ones.

## 2.4 Sample

Since the study targeted the users of OHI, purposive sampling technique was applied to derive the sample of 300 respondents including both digital natives and digital immigrants.

## 2.5 Tool of data collection

The questionnaires included structured, pre-coded items. The questionnaire comprised the following two sections:

- Questions related to the consumption of OHI about both the general health issues and Covid19.
- Questions related to level of perceived usefulness of OHI.

## **2.6 Sociodemographics**

Socio demographic characteristics in present study included: (a) gender (male, female), (b) age (youth, middle age), (c) monthly income (less than Rs. 50,000, Rs. 51,000–100,000, Rs. 1001000-150000, Rs. 151000 or more), (d) level of education (Intermediate, Graduation, Post-graduation) and (e) Health Status (Pretty good, Satisfactory, Poor).

## **2.7 Usage**

Items were designed to measure the Usage of internet as HIS during Covid19. Respondents were asked, to select from 1 (not at all) to 5 (a lot), to report their degree of the use for each suggested need which included information about Covid19 and general health related information. A Cronbach alpha values of .91 ensured the reliability of the tool.

## **2.8 Perceived Usefulness of Online Health Information**

Items were designed to measure the perceived usefulness of OHI during Covid19. Respondents were asked, to select/tick option from 1 (not at all) to 5 (a lot), to report the extent to which they had found information about Covid19 and health topics on the Internet as useful in acquiring information about Covid19 and other health issues, in making health related decisions and in providing emotional support. Cronbach alpha value for items designed to measure perceived usefulness was .96.

## **2.9 Psychological effects**

Additional items were designed, beside adopting items constructed by Professor Gordon Asmundson, a professor of psychology at the University of Regina to trace the presence of psychological effects. A Cronbach alpha .83 demonstrated adequate internal consistency for these items.

## **2.10 Statistical Analyses**

SPSS Version 17.0 was used for data analysis. To test Hypothesis 1, we conducted Pearson product moment correlation coefficient. Independent sample T-test was used to test the hypothesis of difference in means for perceived usefulness due to socio demographics (age and gender), whereas One-way ANOVA was used to seek difference in means for perceived usefulness caused by socio demographics (i.e. education, income and health status). Perceived Usefulness of OHI was the dependent variable and demographics were the predictor variable. In the second analysis, the dependent variable was psychological effects (cyberchondria), whereas Usage was factor variable.

### 3)RESULTS

Table3.1

Correlations			
		<b>Usefulness</b>	<b>Total Use</b>
<b>Perceived Usefulness</b>	Pearson Correlation	1	.410**
	Sig. (2-tailed)		.000
	N	297	297
<b>Usage</b>	Pearson Correlation	.410**	1
	Sig. (2-tailed)	.000	
	N	297	300

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

Table 3.2

Descriptive Statistics			
	<b>Mean</b>	<b>Std. Deviation</b>	<b>N</b>
<b>Usefulness</b>	56.70	19.631	297
<b>Total Use</b>	43.6433	14.06731	300

The relationship between perceived usefulness of OHI and Usage of Online health sources was investigated using Pearson product-moment correlation coefficient. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity and homoscedasticity. There was a strong, positive correlation between the two variables [ $r=.41$ ,  $n=297$ ,  $p<.0005$ ], with high levels of usage associated with greater of perceived usefulness of OHI. as compared to those with graduation or intermediate level of education.

**Table 3.3a: Independent Sample T-Test to measure difference in perceived Usefulness of OHI on gender basis**

Group Statistics					
	<b>Gender</b>	<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>Sig</b>
<b>Usefulness</b>	Male	116	63.73	21.079	.000
	Female	181	52.20	17.252	

Table 3.3b: Independent Sample T-Test to measure difference in perceived Usefulness of OHI on the basis of Age

Group Statistics					
	Age	N	Mean	SD	Sig
Usefulness	1835	126	60.12	18.417	.09
	36above	171	55.80	18.732	

An independent sample t-test was conducted to compare the score of perceived usefulness of OHI for males and females. There was a statistically significant difference in scores for males ( $M=63.73$   $SD=21.07$ , and females ( $M=52.20$ ,  $SD=17.25$ ,  $t(297) = .00$   $p=$ ). The magnitude of the difference in the means (mean difference= $11.53$ , 95% CI 7.12 to 15.94) was large ( $\eta^2=.08$ ). Results of independent sample t-test demonstrate that male users had perceived OHI as useful more than their counterparts i.e. the female users.

An independent sample t-test was conducted to compare the score of perceived usefulness of OHI for digital natives (18-35 yrs of age) and digital immigrants (35 and above). There was no significant difference in scores for digital natives ( $M=60.12$   $SD=18.41$ , and digital immigrants age users ( $M=55.80$   $SD=18.73$ ,  $t(297)=.09$ ). The magnitude of the difference in the means (mean difference= $4.3$ , 95% CI  $-.70$  to  $9.32$ ) was also very small ( $\eta^2 = .009$ ).

Table 3.4a: One Way ANOVA (Education level and perceived usefulness):

Descriptive				
	N	Mean	Std. Deviation	Std. Error
Under Graduate	27	55.26	19.336	3.721
Graduate	115	53.15	19.507	1.819
Post Graduate	155	59.59	19.435	1.561
Total	297	56.70	19.631	1.139

ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2804.860	2	1402.430	3.705	.026
Within Groups	111271.066	294	378.473		
Total	114075.926	296			

A one-way between-groups analysis of variance was conducted to explore the difference of perceived usefulness of OHI due to education level. Subjects were divided into three groups according to their education level (Group 1:



Undergraduates, Group 2: Graduation and Group 3: Post-graduation). There was a statistically significant difference at the  $p < .05$  level in perceived usefulness score for the three groups [ $F(2,294)=3.7, p=.02$ ]. .Eta squared was used to calculate the effect size, which was found.02. Tukey HSD, Post-Hoc was conducted to find significance of difference between the mean score of groups i.e. Under graduation level, Graduation level and Post-graduation level and it turns out that mean score for group 3 ( $M= 59.59, SD=19.43$ ) was significantly different from Group 2 ( $M= 53.15, SD=19.50$ ) and Group 1 ( $M= 55.26, SD=19.33$ ). Respondents with highest level of attained education i.e. post-graduation reported highest perceived usefulness of OHI as compared to those with graduation or intermediate level of education. Table 3.4b: One Way ANOVA (Income and Perceived Usefulness of OHI):

Descriptive				
	N	Mean	Std. Deviation	Std. Error
<b>Less Than 50 Thousand</b>	46	52.13	19.785	2.917
<b>50 Thousand - 1 Lac</b>	104	61.03	17.958	1.761
<b>1 Lac - 1.5 Lacs</b>	53	53.02	21.087	2.897
<b>Above 1.5 Lacs</b>	94	56.23	19.804	2.043
Total	297	56.70	19.631	1.139

ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
<b>Between Groups</b>	3647.963	3	1215.988	3.226	.023
<b>Within Groups</b>	110427.963	293	376.887		
Total	114075.926	296			

A one-way between-groups analysis of variance was conducted to explore the difference of perceived usefulness of OHI due to education level. Subjects were divided into three groups according to their income Group 1: Less Than 50 Thousand, Group 2: 50 Thousand - 1 Lac, Group 3: 1 Lac - 1.5 Lacs and Group 4: Above 1.5. There was a statistically significant difference at the  $p < .05$  level in perceived usefulness score for the four groups [ $F(3,293)=3.22, p=.02$ ]. .Eta squared was used to calculate the effect size, which was found.03. Tukey HSD, Post-Hoc was conducted to find significance of difference between the mean score of groups and it turns out that mean score for group 2 ( $M= 61.3, SD=17.95$ ) was significantly different from Group 1 ( $M= 52.13, SD=19.78$ ), Group 3 ( $M= 53.02, SD=21.08$ ) and Group 4 ( $M= 56.23, SD=19.80$ ). Surprisingly the Perceived Usefulness was reported higher by group 2 that consisted of low socio-economic respondents.

Table 3.5

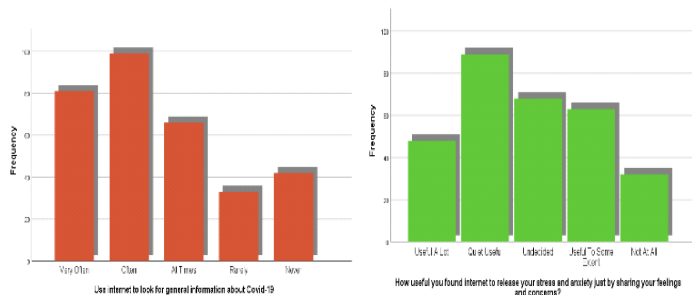
Correlations(usage and psychological effects)			
		Total Use	Psychological Effects
Total Use	Pearson Correlation	1	-.599**
	Sig. (2-tailed)		.000
	N	300	300
Psychological Ef- fects	Pearson Correlation	-.599**	1
	Sig. (2-tailed)	.000	
	N	300	300

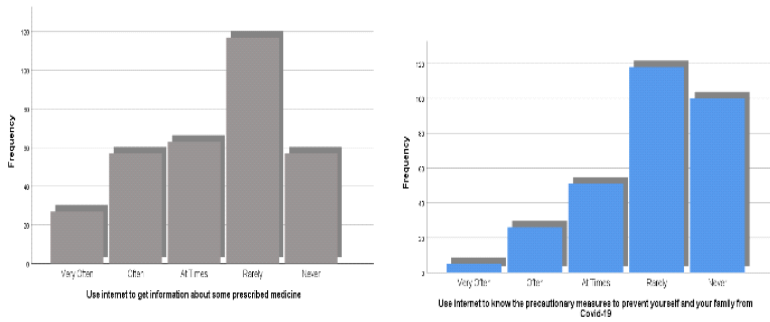
**\*\*.** Correlation is significant at the 0.05 level (2-tailed).

The relationship between perceived usefulness of OHI and Usage of Online health sources was investigated using Pearson product-moment correlation coefficient. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity and homoscedasticity. There was a strong, negative correlation between the two variables [ $r = -.59, n = 297, p < .0005$ ], with high levels of usage associated with less psychological effects.

## DISCUSSION

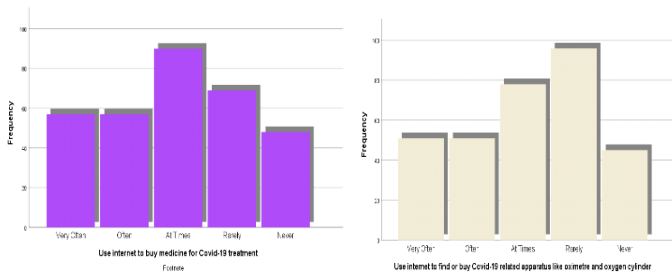
Beside identifying the health-related needs of users, this study explored how increased usage and dependence during crisis situations like Covid19 influences perception of the users regarding the usefulness of online health information among diverse audiences. Analysis of the major findings is as following;





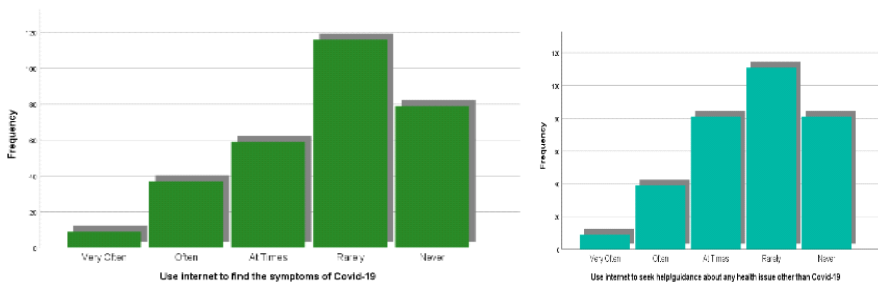
### 4.1 Needs

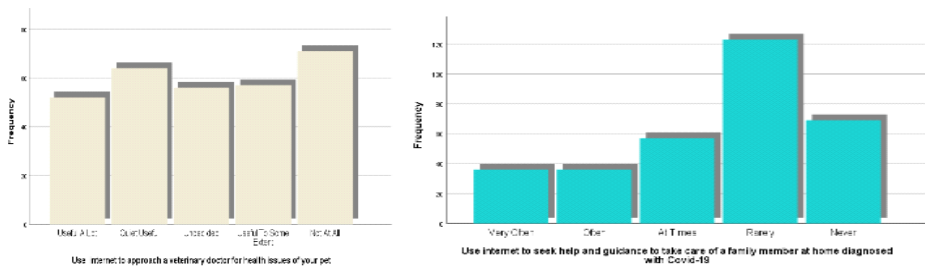
The study found a higher level of use of internet for the gratification of health-related needs among users. The identified needs were categorized as informational, behavioral and psychological needs. Informational needs included information related to both Covid19 and general health issues. The other category was psychological needs which included anxiety relief and emotional support during Covid19 in



general and by those diagnosed with Covid19 in specific. The behavioral needs included decision making role such as taking precautionary measures or buying medicines and apparatuses for Covid19 treatment e-g oxygen cylinders and oximetre.

### 4.2 Consumption





The needs to acquire general information about Covid19 and to find the symptoms of the disease were significantly high and were found on top among the consumption of online sources. This confirms the increased dependency of people on Online health information sources during pandemic. Findings revealed that a significant majority of respondents i.e. 76% used online sources to seek moral support after they were diagnosed Covid positive. Similarly, the ratio of the users who utilized OHI to seek guidance and help in order to take care of some Covid positive family member was also significantly high. Though the no of those who reported to go online very often to release stress and anxiety caused by the disease was not notably high but those who often and at times was as compared to those who rarely or do not use at all. Similar results were found regarding the usage of online sources for purchasing medicines and health related apparatuses amid Covid19. Online sources were found to be an important source for the issues related to their general health. These sources were reported helpful not only to self-health and the health of dear ones but also for the health issues of the pets.

### 4.3 Reasons

The major reason to turn towards internet was that people wanted to avoid in person visit to hospitals and doctors. During the spread of contagious diseases like Covid 19, where everyone has equal probability to get infected, it seems a natural behavior. Users who reported to use internet as HIS because of the easy access to health-related information had equal ratio. Previous studies have also found that an increased use of internet for health-related information and in making health decisions is easy Information retrieval and Ubiquitous access (Tonsaker et al., 2014). An opportunity to get information from large number of diverse sources also increased the use of internet as HIS during Covid19. The pandemic has caused an environment in which uncertainty about the origin and nature is very high. There are many theories about symptoms, reasons of spread, and treatment across communities. In such situations, the increased dependence of people has already been predicted. (Mitomo et al., 2012; Longstaff, 2005; Ball-Rokeach,1985). Other reported reasons to use internet as HIS included an opportunity to use a source as many times as the user needed, and look for information until they accessed the required information and could get satisfaction to their queries without causing embarrassment to someone.

### 4.4 Socio demographics and Perceived Usefulness

Findings suggest that significant socio demographic disparities in perceived usefulness of online health communication exist at varying levels of usage. However, age and health status did not predict perceived usefulness of online health information. One key finding is that gender was found a predictor of differences in perceived usefulness in online health communication. Women are considered active health information seekers and are more likely than men to consult more types of health information sources (Rowley et al., 2015). The study, however found male users considering OHI as more useful than females. Future research should explore why women with high Usage perceive online health information as less useful This also highlights the need to explore the motivational factors that cause this difference, as present study had focused only on health-related needs.

The Perceived Usefulness was reported higher by low socio-economic respondents. One possible explanation can be the little or no access to medical facilities and lack of medical professionals in peer or personal contacts. Internet being a cheap and convenient source works as an alternative source of first hand information related to their health issues particularly about the ones they are in urgent need of information. The relationship between Usage and perceived usefulness explains not only the reason of high perceived usefulness among low SES respondents, but also highlights the role of new media in narrowing the gap between haves and have-nots. Similar to previous research, respondents with higher level of education reported to perceive OHI as more usefulness than those having graduation and intermediate level degree van Deursen & Dijk (2013) for instance found education level of attainment as one of the most important contributors to the informational (finding information) and Strategic(using the information for personal benefits)internet skills. Ettema and colleagues have also suggested motivational and situational variables as being more important than SES in reducing digital divide (Ettema& Kline, 1977).

Though motivation, access and skills are identified as significant prerequisites of the usage and benefitting from internet, they however are not sufficient. The difference in reported perceived usefulness can also be an outcome of differential skills and the nature of Internet use (e.g. Brandtzag et al., 2010; Hargittai & Hinnant, 2008)and the eHealth literacy of the users. Some other factors like personality attribute and preexisting attitude towards OHI including Trust can also have influence on the perceptions of users. Trust in HIS, for example has been reported as a significant variable in studies on health information and varies among diverse socio demographic groups (Paige et al., 2016). Similarly, how significant the health information and its implication are also considered an important factor related to health communication behavior (Han et al., 2010).

Although the significance of internet as HIS in general, and as an alternative source of health professionals in crisis situations has been well realized, the negative consequences due to the exposure to OHI, however, have also been found. Particularly in a feared environment like Covid19,the usage was assumed to cause such unintended effects, as predicted by uses and gratification theory. The findings however came up with a surprisingly unexpected relationship between the Usage and psychological effects by revealing more exposure causing less psychological effects i-e fear and anxiety. This can be interpreted as the increased trust between the users and the online health information sources.

## CONCLUSION

The study found a strong association between the usage and perceived usefulness of online sources for the users seeking health related information and support. Results support that the differences in consumption of OHI exist due to demographics which highlights the need to give serious consideration to the audience segmentation while tailoring online health information. Less psychological effects among the users with greater consumption in some way also signify the exposure of OHI as being able to outweigh its possible negative consequences.

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