

## A Health Information Seeking Behavior on Internet for Health-related Problems: Perception and Impact on Mental Health of Engineering Students of Jodhpur, India

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### Abstract

**Introduction:** Internet has become a very popular tool for health information seeking among young adults. The study was designed to explore this behavior among the engineering students of Jodhpur city. **Methods:** It was a questionnaire based cross-sectional study on engineering students (n=120) who have ever searched the Internet for their health problems. Information was collected on Likert's-five point scale and data were presented as frequencies. The association of the perception of the Internet as the source of health information was evaluated. **Results:** Internet based self-diagnosis and self-medication were reported by 52 (43.33%) and 43 (35.83%) students respectively. Three-fourths of participants searched for symptoms online. The majority students (80.83%) preferred Google/Yahoo search engines. Only 48 (40%) participants accepted the Internet search as a good option for solutions to their health-related problems. Online health information adversely affected students' minds leading to over-thinking in 52 (43.33%), stress in 39 (32.5%), restlessness in 38 (31.67%), sleeplessness in 33 (27.5%) and depressed feelings in 32 (26.67%) and more confusion in 46 (38.33%) participants. However, 53 (44.17%) participants felt reassured by the Internet search results. The perception of the Internet search as a good option for finding solutions to health problems was positively associated with accuracy, accessibility, understandability of the found information ( $P=0.000$ ), feeling reassured ( $P=0.03$ ) and sharing of the information with family ( $P=0.01$ ) and health professional ( $P=0.01$ ). **Conclusion:** The students use the Internet in various ways for health information seeking despite the adverse mental effects and non authenticity/reliability of the contents available online.

**Keywords:** Internet, health information seeking behavior, health-related problems, engineering students

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### Introduction

With the beginning of the 21<sup>st</sup> century, a technological revolution has taken place throughout the globe marking the tremendous development in information and communication technologies, especially in terms of Internet access which will reach almost two-thirds of the global population by 2023[1]. In India too, the Internet penetration rate was recorded as 59% at the end of March 2021 leading to increased awareness for obtaining any information through just one click[2]. Nowadays, especially in this COVID pandemic time, the Internet has become an important, universal, easily accessible, confidential and anonymous source of health-related information[3-5]. Given that in India the largest and very active segment of Internet users comprises of adolescents and young adults[6]. Many previous studies from India and abroad showed evidence that users of health-related information on the Internet are younger, more educated, college students and more likely to be female[3,6-10].

It has been postulated that the ability of the individual to use the source for searching of the information is governed by the knowledge or the experience of the source[3,4]. Previous studies also emphasized greater use of the Internet for seeking health information among college students than any other group of population because they frequently access the Internet as part of their curriculum[11,12]. After obtaining the information, its' comprehending and self-efficacy are further important as it affects behavioral change, usage of health services and making proper health-related decisions[13,14]. Further, there is evidence of positive as well as the negative impact of online health information seeking on mental health leading to

reassurance or stress, anxiety and depression in varying numbers of participants[12,15,16].

Nevertheless, the credibility, accuracy, and reliability of health information on the Internet are of great concern. In the current era of digitalization particularly in India, whether health information obtained online influences the medical decision making of the health information seekers is, to the best of our knowledge, under-researched.

The main objectives of the study were as follows

1. To assess the type of symptom, disease, treatment surfed online and frequency of same amongst undergraduate engineering students of Jodhpur city.
2. To evaluate the impact of health information seeking on the mental health and decision making of the participants.
3. To assess the association of online surfing of health-related information and change in mindset, health management decisions in Jodhpur amongst undergraduate engineering students.

### Materials and methods

The study was an observational research design with a questionnaire-based quantitative approach. The target population was the undergraduate engineering students of Jodhpur city. The sample size was calculated at 95% confidence interval and 10% relative error using the formula for the sample size for estimation of a single sample proportion -  $N = \frac{\{(Z_{1-\alpha/2})^2 * P(1-P)\}}{E^2}$  Where,  $Z_{1-\alpha/2}$  = Standard normal deviate for 95% confidence interval (taken as 1.96)

$P$  = expected proportion of individuals who searched online for health-related problems and changed their decision (taken as 38% as per reference)[17].

$E$  = relative error (taken as 10%)

The sample size was calculated to be 91, which was enhanced to 120 subjects.

### Inclusion criteria

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Undergraduate engineering students of Jodhpur (of any semester) who have ever searched the Internet for health information for their health problems were chosen for the study. Random selection from colleges was done.

**Exclusion criteria**

1. Students who were already suffering from any psychiatric disorder.
2. Students who didn't search online for their health problems.
3. Students who didn't give informed consent.

**Ethical permission**

The study was conducted within the bounds of the Helsinki Declaration. Ethical approval for conducting the study was obtained from Institutional Ethical Committee (Approval Number: SNMC/IEC/2020/1040-1042, dated 4<sup>th</sup> September 2020).

**Data collection method**

A semi-structured questionnaire was designed based on previous studies[17,18], validated by two renowned experts and pretested on a small group of students.

**Data collection process-**Data collection was done for two months October and November 2020. The random selection of participants from the engineering colleges located in Jodhpur district was done. The purpose of the study was explained to the eligible participants and consent was obtained from them through digital means. Data were collected using the questionnaire by digital means using Google form. After obtaining consent from the student, the link of the form was shared to obtain information.

A total of 15 questions with multiple subparts were designed and most of the responses were obtained in Likert's 5 point scale. The questionnaire was broadly divided into 4 headings:

**Basic-demographic data:** Information was obtained about socio-demographic data, i.e., age in years, gender and residential background from all the subjects.

**Online health information seeking behavior:** Data were collected regarding this by inquiring about self-diagnosis and self-medication based on online search results, online source preferred for obtaining information, checking for the reliability of searched data, online surfing before and after visiting doctor including looking for symptom and its causes, self-diagnosed or previously diagnosed disease, information on a given medical treatment or procedure, cross-checking diagnosis, prescribed drugs, alternative treatments or

medicine, medical reports details and terminologies. Responses to all these were collected on Likert's 5 point scale (Never, Hardly, Occasionally, Often and Always). Data regarding the most common searched symptom was accepted through an open-end question. *Students' Usage of Information sought on the Internet:* This section was devised to know what decision they took regarding obtained online health-related information (trusted doctor's opinion or Internet findings or revisited same doctor/ another doctor to inquire further). Responses to all these was collected on Likert's 5 point scale (Never=0, Hardly=1, Occasionally=2, Often=3 and Always=4).

**Perception and Consequences of online search results:** Information collected here was about perception(quality of information sought from the Internet, whether a better option for health problems or not) and consequences of online search results on mental health (anxiety, sleeplessness, stress, over-thinking, searching more about it, worsened symptoms, depressed feeling). Changes in mindset due to search results (felt reassured, overwhelmed, more confused, took problem more seriously) were also recorded from all participants. Responses to majority of these were collected on Likert's 5 point scale (Strongly disagree, Disagree, Undecided, Agree, Strongly Agree). Lastly at the end, to obtain the final opinion of the participant regarding online searching for health-related information, a dichotomous question was asked about their thinking of the Internet as a good option for finding solutions to health-related problems with two options of 'yes' or 'no'.

**Statistical analysis-**The information collected through the questionnaire was entered into appropriate databases. The data were summarized as frequency and percentage. The association of the perception of the engineering students about the Internet as a good option for finding solutions to health-related problems was further analyzed with the basic demographic characteristics, responses of the students about their mental status and change in mindset using the Chi-square test. A P-value ≤ 0.05 was taken as statistically significant. All statistical analyses were done using Open Epi Info version 3.01.

**Observations and results**

Among 120 engineering students, male participants were 84 (70%) and almost half of the study participants i.e. 63 (52.5%) belonged to the age group of 20-22 years. The demographic features of participants are given in Table 1.

**Table 1: Basic demographic details of the participated engineering students:**

Category	Sub category	Engineering Students (N=120) n (%)
Age	17-20 years	35 (29.17%)
	20-22 years	63 (52.5%)
	22-24 years	19 (15.83%)
	24-26 years	2 (1.67%)
	5 and above	1 (0.83%)
Gender	Male	84 (70%)
	Female	36 (30%)
Background	Rural	31 (25.83%)
	Urban	56 (46.67%)
	Semi-urban	33 (27.5%)

**Searching information for health-related problems-**The engineering students were asked about their approach towards the solution of their health-related problems. More than half of the students, i.e. 73 (60.83%) (including Occasionally, Often and Always Likert's scale) opted to visit doctor, 70 (58.33%) students preferred to self diagnose on their own/ through family/ peer group, less than half of the students 56 (46.66%) opted to visit a chemist and 56 (46.66%) students also reported to self medicate on their own or through family/ peer groups' advice. Whereas, 52 (43.33%) students self-diagnosed after surfing the Internet and 43 students (35.83%) reported to self medicate after surfing the Internet. See Table 2.

**Table 2: Health Information Seeking Behavior**

Preference for health-related problems:	Never n (%)	Hardly n (%)	Occasion-ally n (%)	Often n (%)	Always n (%)
a. Visit doctor:	10 (8.33)	37 (30.83)	43 (35.83)	20 (16.67)	10 (8.33)
b. Visit chemist :	27 (22.5)	37 (30.83)	30 (25)	20 (16.67)	6 (5)
c. Self diagnose on your own/through family/peer group:	24 (20)	26 (21.67)	32 (26.67)	22 (18.33)	16 (13.33)

d. Self diagnose after surfing Internet:	40 (33.33)	28 (23.33)	25 (20.83)	18 (15)	9 (7.5)
e. Self medicate on your own/through family/peer group:	31 (25.83)	33 (27.5)	29 (24.17)	12 (10)	15 (12.5)
f. Self medicate after surfing Internet:	50 (41.67)	27 (22.5)	27 (22.5)	8 (6.67)	8 (6.67)
<b>Internet resource preferred:</b>					
a. Internet search engines (eg. Google, Yahoo, Youtube):	11 (9.17)	12 (10)	15 (12.5)	29 (24.17)	53 (44.17)
b. Online discussion forums (e.g., medical-related online forum, bulletin board system (BBS):	50 (41.67)	27 (22.5)	22 (18.33)	13 (10.83)	8 (6.67)
c. Websites of the social media platforms and social networking services (e.g., Facebook, Twitter, Instagram):	45 (37.5)	26 (21.67)	12 (10)	20 (16.67)	17 (14.17)
d. Medical websites/ hospital websites:	43 (35.83)	26 (21.67)	27 (22.5)	17 (14.17)	7 (5.83)
e. Doctor’s websites:	59 (49.17)	24 (20)	17 (14.17)	11 (9.17)	9 (7.5)
<b>Reliability of the online surfed site/data checked:</b>					
<b>Surfed online before visiting doctor:</b>					
a. Your symptoms and their causes.	15 (12.5)	14 (11.67)	26 (21.67)	38 (31.67)	27 (22.5)
b. Previously diagnosed disease (by a health professional) /treatment/ medical procedure concerning it.	30 (25)	17 (14.17)	29 (24.17)	31 (25.83)	13 (10.83)
c. Self-diagnosed (from Internet) disease/treatment/medical procedure regarding it.	36 (30)	29 (24.17)	23 (19.17)	20 (16.67)	12 (10)
<b>Surfed online after visiting doctor:</b>					
a. Crosscheck the diagnosis whether it is correct or not.	43 (35.83)	30 (25)	18 (15)	15 (12.5)	14 (11.67)
b. Check whether the given treatment by the doctor is safe/ accurate or not.	39 (32.5)	29 (24.17)	27 (22.5)	12 (10)	13 (10.83)
c. Check for the other brands of the same drugs or alternate of the prescribed drug.	41 (34.17)	30 (25)	24 (20)	14 (11.67)	11 (9.17)
d. Check medical reports’ details and terminologies.	24 (20)	19 (15.83)	30 (25)	27 (22.5)	20 (16.67)
e. Change your medication without discussing it with your doctor.	75 (62.5)	20 (16.67)	12 (10)	6 (5)	7 (5.83)

**Preference of the Internet resource**

For health information searing on Internet, 97 students (80.83%) chose Internet search engines (e.g. Google, Yahoo); 51 (42.50%) searched medical websites; 49 students (40.83%) visited websites of the social media platforms and social networking services (e.g. Facebook, Twitter, Instagram); 43 (35.83%) students preferred online discussion forums (e.g., medical-related online forum, bulletin board system (BBS) whereas only 37 (30.83%) participants visited doctors websites.

**Checking the reliability of the surfed site/data**

The reliability of the online information was checked by 73 (60.83%) students (including occasionally, often and always degrees).

**Things surfed online before visiting doctor**

Before visiting the doctor, 91 students (75.83%) searched online for their symptoms. Previously diagnosed disease (by a health professional)/ treatment/medical procedure regarding it was searched by 73 students (60.83%). The self-diagnosed disease (from the Internet)/ treatment/medical procedure regarding it was also searched by 55 (45.83%) students.

Participants reported common cold and cough (20.00%) as the most common searched symptom followed by headache (18.30%). See Figure1.

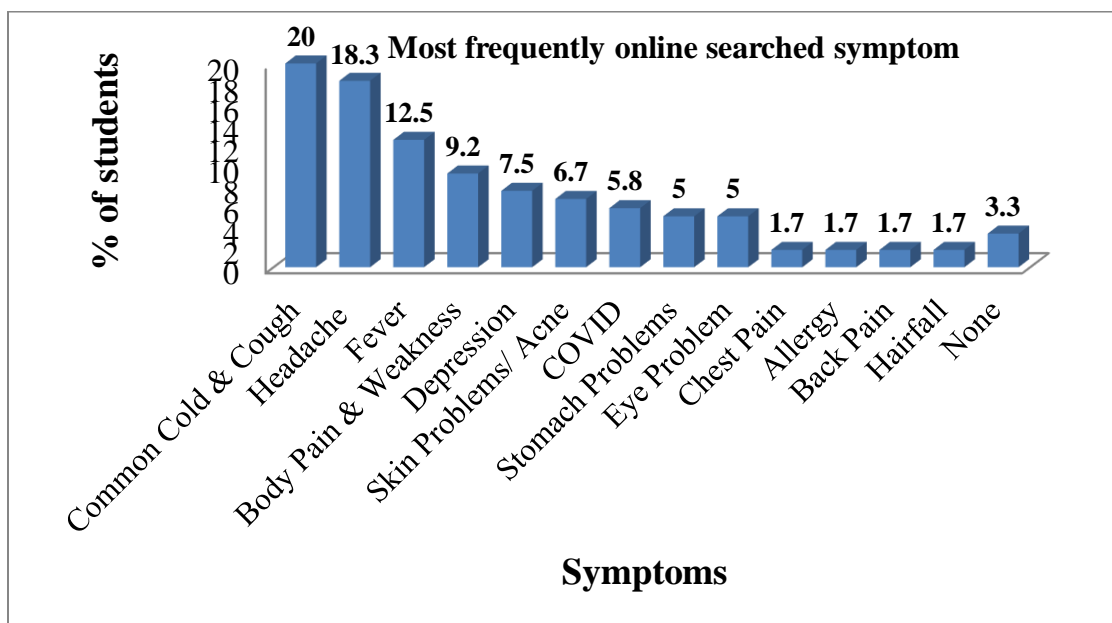


Figure 1: Frequently online searched symptom

**Things surfed online after visiting doctor**

After visiting the doctor, only 47 (39.17%) students crosschecked the accuracy of the diagnosis whereas 52 (43.33%) students checked for the safety/accuracy of the given treatment by the doctor. Medical reports' details and terminologies were searched by 77 (64.17%) participants. Other brands of the same drugs or alternate of the prescribed drug were searched by 49 (40.83%) students. But 75 (62.50%) students 'never' changed their medication without discussing it with their doctor. See Table 2.

**Opinion preferred by students after visiting doctor and surfing online**

After searching the Internet and visiting the doctor, the doctor's opinion was 'always' found optimum by 64 (53.33%) students. However, the opinion of both the Internet and the doctor was considered by 70 (58.33%) participants in their decision making. About half, i.e., 59 of the participants opted to visit another doctor for their health-related problems. Whereas, only 41 (34.17%) students revisited the same doctor to inquire about the Internet search results. See Figure 2.

**Students' Usage of Information sought on the Internet**

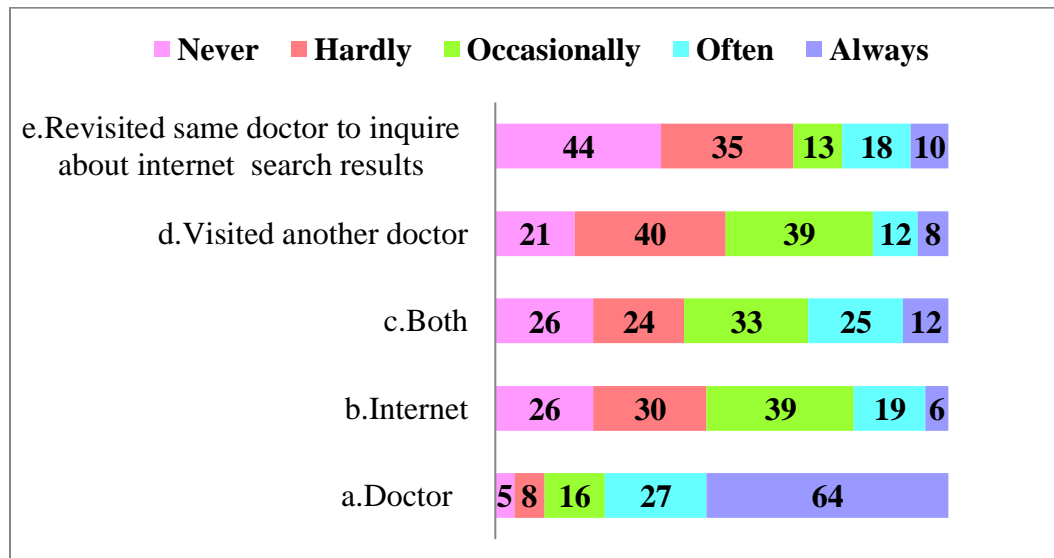


Figure 2: Opinion preferred by students after visiting doctor and surfing online:

**Perception and Consequences of online search results**

**Students' opinion regarding online searching for health problems**

Less than half of the students i.e., 48 (40%) finally accepted the Internet search as a good option for the solution to their health-related problems. See Figure 3.

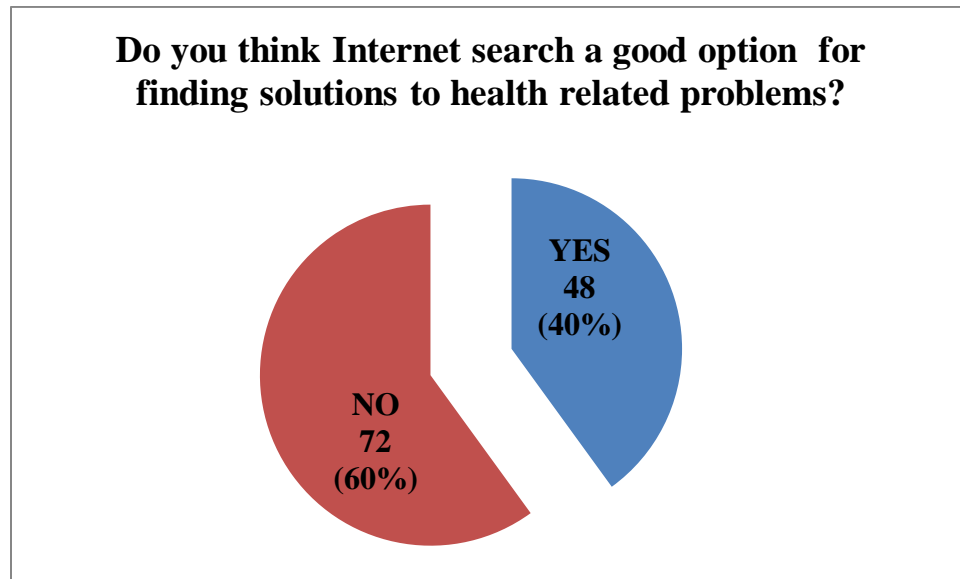


Figure 3: Students' opinion regarding online searching for health problems:

**Health-related online searching effects on mental health**

Health information seeking adversely affected students' minds leading to searching more or ruminating about their health problem in almost half of the participants, i.e. 56 (46.66%) students (including

agree and strongly agree frequencies), over-thinking in 52 (43.33%) students, stress in 39 (32.5%), restlessness in 38 (31.67%), sleeplessness in 33 (27.5%) and depressed feelings in 32 (26.67%) participants. It also led to an aggravation of symptoms

psychologically in 33 (27.5%) students. See figure 4. However, no association was found between the perception of the students regarding the Internet as a good source for finding solutions to health-

related problems and the effects on mental health by  $\chi^2$  test (data not shown).

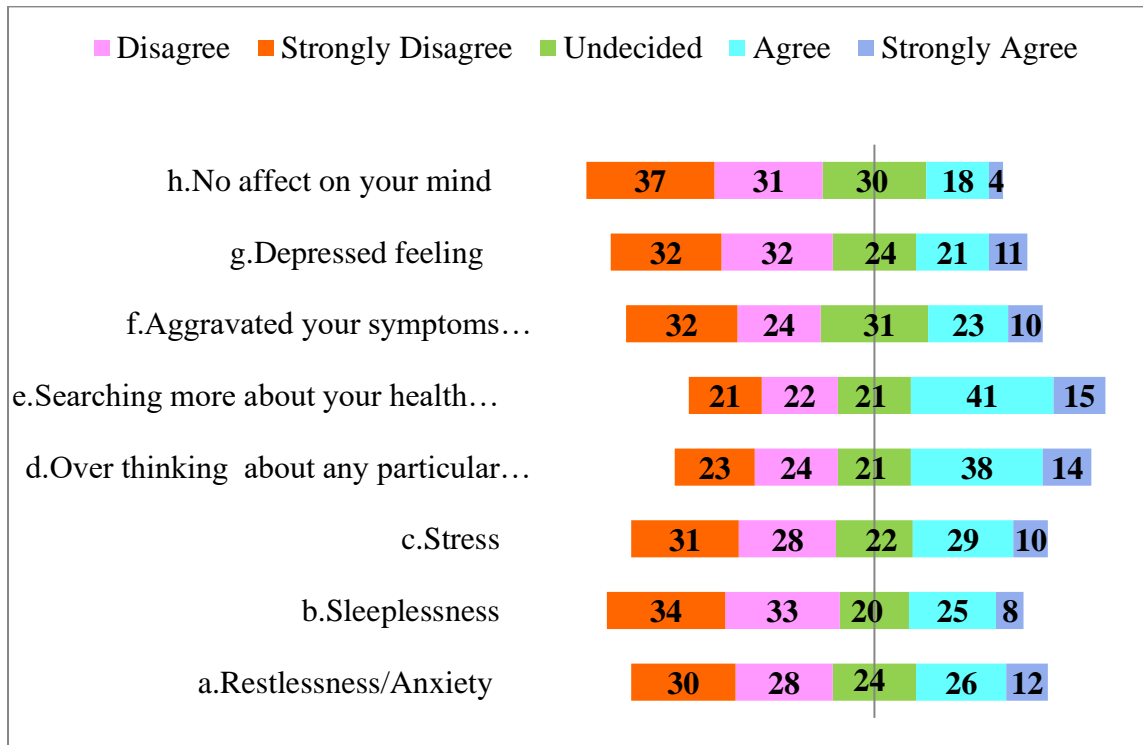


Figure 4: Effects of Online Health Information Seeking on Mental Health

**Change in mindset due to information sought on the Internet**

Almost half, i.e., 57 (47%) students took health problems more seriously due to online surfing. At the same time, it also led to more confusion among 46 (38.33%) participants. However, 53 (44.17%) and 51 (42.5%) students felt reassured and overwhelmed respectively by the search results on the Internet. The feeling of reassurance was positively ( $P= 0.03$ ) associated whereas taking problems seriously was negatively ( $P= 0.04$ ) associated with the perception of the students regarding the Internet as a good source for searching for health information. See Table 3.

**Quality of information sought on the Internet**

Nearly half of the participants, i.e. 55 (45.83%) found the online health information as easily accessible and understandable. Also, it was rated as relevant/accurate by 50 (41.67%) students. The perception of the students regarding the Internet as a good source of solution to their health-related problems was highly significantly associated with the feeling of quality of information as relevant, accurate ( $P<0.001$ ), easily understandable and accessible ( $P<0.001$ ). See Table 3.

Table 3: Association of students' perception for the Internet with change in mindset and quality of information

Did the information you found on the Internet change the way you think about your health?						
Is Internet search a good option for finding solutions to health-related problems?	Yes (N= 48)		No (N= 72)		$\chi^2$	P
	SA/A n (%)	SD/D n (%)	SA/A n (%)	SD/D n (%)		
You felt reassured	17 (14.17)	15 (12.5)	16 (13.33)	38 (31.67)	4.69	<b>0.03</b>
You felt overwhelmed	13 (10.83)	18 (15)	12 (10)	33 (27.5)	1.94	0.16
You took problems more seriously	24 (20)	8 (6.67)	33 (27.5)	29 (24.17)	4.19	<b>0.04</b>
You took problems less seriously	8 (6.67)	31 (25.83)	8 (6.67)	47 (39.17)	0.58	0.49
You felt more confused	16 (13.33)	13 (10.83)	30 (25)	26 (21.67)	0.02	0.88
You felt less confused	9 (7.5)	20 (16.67)	11 (9.17)	44 (36.67)	1.27	0.25
Upon surfing online, the information you found regarding health issues were:						
Is Internet search a good option for finding solutions to health	Yes (N= 48)		No (N= 72)		$\chi^2$	P

related problems?						
	SA/A n (%)	SD/D n (%)	SA/A n (%)	SD/D n (%)		
Quite relevant/accurate	32 (26.67)	8 (6.67)	18 (15)	32 (26.67)	17.42	<b>0.0000</b>
Vague/unauthentic	7 (5.83)	17 (14.17)	15 (12.5)	26 (21.67)	0.37	0.54
Easy to understand and access	31 (25.83)	6 (5)	24 (20)	30 (25)	14.21	<b>0.0002</b>

#### Sharing findings and mental status with others after online searching

Health-related information sought on the Internet and the resultant mental status was discussed with friends by 79 students (65.83%), with family by 68 (56.67%) students and with a health care professional by 62 (51.66%) students. Further, the perception of the students regarding the Internet as a good source of solution to their health-related problems was highly significantly associated with their discussion of the findings (diagnosis) and their mental status with the family ( $P=0.01$ ) and health care professional ( $P=0.01$ ). See Table 4.

**Table 4: Association of students' perception for the Internet with sharing of the findings and mental status after online searching**

Did you discuss your Internet finding (diagnosis) with (discussions regarding your mental status):								
Is Internet search a good option for finding solutions to health-related problems?	Yes (N= 48)			No (N= 72)			$\chi^2$	P
	Never /Hardly n (%)	Occasionally n (%)	Often /Always n (%)	Never /Hardly n (%)	Occasionally n (%)	Often /Always n (%)		
Family	15 (12.5)	11 (9.17)	22 (18.33)	40 (33.33)	16 (13.33)	16 (13.33)	8.79	<b>0.01</b>
Friends	13 (10.83)	11 (9.17)	24 (20)	28 (23.33)	20 (16.67)	24 (20)	3.43	0.17
Health professional	18 (15)	9 (7.5)	21 (17.5)	40 (33.33)	18 (15)	14 (11.67)	8.27	<b>0.01</b>
Not talked about it to anyone	32 (26.67)	10 (8.33)	6 (5)	49 (40.83)	13 (10.83)	10 (8.33)	0.17	0.92

#### Discussion

Online surfing for health-related problems is widely practiced, albeit no proper guidance and solution is found online for the health problem. This study threw light on the same issue mentioned. It provided insight into the extent of Internet use for health-related problems and reflected the effect of this behavior on health management decisions and mental health of the engineering students of Western Rajasthan.

We evaluated the preference of seeking a solution to the health-related problems of the students. The majority of the participants (61%) opted to visit doctors, 58% preferred to self diagnose on their own/ through family/ peer group which fairly matched the findings of the study on Manipal University students where 57% respondents trusted doctors and 59% trusted family for health information[1].

This study explored in detail various dimensions of the students' behavior of seeking information on the Internet for their health-related problems. The findings revealed that out of total of 120 participants, 39% of students preferred the Internet for self-diagnosis which is quite extensive. Similarly, Basch and colleagues reported 31% of U.S. college students used the Internet for self-diagnosis[8].

In our study, among 120 engineering students, 35.83% used the Internet to self-medicate which is much higher. In Pune based study on the general Indian population, 60% of responders used the Internet to obtain health information and self-medication[19].

We found Internet search engines (e.g. Google, Yahoo) as the most preferred Internet resource for searching health-related solutions by 81% of students whereas 43% searched medical websites. Slightly higher findings had already been shown in the studies on Ghanaian graduate students[3] and Kuwait's undergraduate students[20] demonstrating the use of search engines to obtain health information by 91% and 87% of respondents respectively. However, recently slightly lower and similar findings were obtained regarding the use of search engines among Iranian university students (71%)[21]; and the use of specific health websites among Ghanaian students (40%) respectively[3]. Also in Pune based Indian study, Google was the most common site (93.8%) surfed by participants for health information[19]. Contrastingly, in the US Pew survey on the general population, 66% of participants began their online search with search engines such as Google or Yahoo, with 27% also preferring a specific health-related website[22].

The online searching for symptoms and their causes was done by 76% of participants in the current study which was comparable to the findings of Kwakernaak et al. reporting 65.8% participants searched

online for symptoms rather than a particular disease[23] and 70% students from Iranian study[21]. However, only 45% of participants searched for the causes and symptoms of the disease in a study on graduate students from Kuwait[20]. Furthermore, our study reported surfing of the self-diagnosed disease by 46% of students only.

In our study common cold and cough (20%) and headache (18%) were the most common searched symptoms. Our findings in this regard can also be justified as this research was carried out in the COVID19 period.

In the present study, the Internet was used by 39% of students to crosscheck the diagnosis given by the health professional and 43% of students to check for the safety and accuracy of treatment prescribed. However, previously a relatively higher i.e. 65% of respondents reported using the Internet for information on the side effect of medication[3]. Furthermore, 41% of students looked online for alternatives of prescribed treatment which was similar to that study (43%)[3].

Iverson et al. reported that after surfing online, patients adhered more to physician's advice (54%)[18], which was in concordance with the current study where 53.33% of students found the doctor's advice always optimum in comparison to the Internet information. However, at the same time, our study also stressed that more than half, i.e. 58.33% of the respondents preferred the combined opinion of the Internet as well as the doctor for their decision making. Chen et al. found that 38% of 457 participants changed their medical decision after searching online for health information[17].

We found changes in the medical decision as about one-fifth of the students changed their medication without discussing it with the doctor and about half of the participants visited another doctor after surfing online and more than a third participant revisited the same doctor to inquire about Internet search results. Identically, previous studies from Kuwait[20] and Ghana[24] reported 22.08% and 23.7% of students changed their medication without discussing it with their doctor after searching online health information, respectively. However, the results for the same were on a much higher side in the latest Pew Internet Project survey, where 59% of newly diagnosed patients asked more questions to the same doctor or sought a second opinion after assessing information on the Internet[20].

The present study reported 40% of the respondents thought Internet search to be a good option for finding solutions to health-related problems. This finding stood in contrast when compared to a recent study on Ghanaian graduate students[3] reporting a huge majority, 90.9% of the respondents indicated trust in online health information.

In our study, nearly half of the participants (45.83%) found the online health-related information as easily accessible and understandable; and its quality was rated as relevant/accurate by 41.67% of students. Contrastingly, according to the recent studies on university students, the majority i.e. more than 90% of respondents mentioned the above-cited features of the Internet as their reason to prefer the Internet for seeking health information[21,24]. However, in another study on students, these features were listed by around two-thirds of the participants as the important factors for choosing the Internet for assessing health information[20].

Many previous studies have highlighted the negative effects of Internet based health information seeking on the mental health resulting in anxiety, stress, depression and fear[12,15,16,25]. Our findings matched with the above previous studies as we reported increased rumination and over-thinking in almost half of the students. Online health information led to stress in 39 (32.5%), restlessness in 38 (31.67%), sleeplessness in 33 (27.5%), aggravation of psychological symptoms in 33 (27.5%) and depressed feelings in 32 (26.67%) participants. The findings were comparable to the recent Polish survey which reported 29.6% adult participants and 34.5% better educated respondents to feel anxiety or fear[26]. However, in contrast to our findings, a recent survey done on Kuwait University students reported feelings of stress and anxiety among 23.26% only[20].

Our study reported a change in mindset of the participant about their health due to online searching of health information. Online retrieved information led to more confusion among 38.33% of participants which was higher when compared to Kuwait University students' study (29.64%). In contrast, 44.17% and 42.5% of students felt reassured and overwhelmed respectively which was again higher when compared to felt relieved by 34.03% of students in a previous study[20].

The present study reported sharing of the findings of online search and the resultant mental status with friends by two-thirds and with family or health care professionals by more than half of the respondents. Results proved to be comparable to the outcomes from the previous Indian study on university students in which around 60% of the participants shared their online health information with family and friends[6].

Our study sought to find out the association of the perception of Internet search as a good option for finding solutions to health-related problems with various demographic factors, mental effects, changes in mindset and sharing of the findings. The perception of Internet search as a good option was found to be positively associated with feeling reassured ( $P= 0.03$ ), accuracy, easy accessibility and understandability of information ( $P= 0.000$ ); and sharing of the information with family ( $P= 0.01$ ) and health care professional ( $P= 0.01$ ). On the other hand, the perception of Internet search as a good option was found to be negatively associated with taking problems more seriously ( $P= 0.04$ ) after seeking online health information.

### Conclusion

From the study, we can conclude that the Internet has proved to be an important source of health information seeking among engineering students. The Internet has led to self-diagnosis and self-medication among one-third of the participants. The majority chose search engines for seeking health information and only less than half preferred medical websites. The reliability of the online information was checked by more than half of the students. Three-fourths of the participants searched for the symptoms online. More than a third cross-checked the accuracy of the diagnosis whereas less than half of the participants checked for the safety/accuracy of the treatment given after visiting the doctor. A high majority of the participants preferred the doctor's opinion whereas more than half considered opinion of both doctor and the Internet. So, the trust of the students was seen more towards the traditional sources, i.e., the healthcare professional. Only forty percent of participants perceived the Internet search as a good option for finding solutions to health-related problems. Less than half of the participants found the health information on the

Internet as easily accessible, understandable and accurate/relevant. Health information seeking adversely affected students' minds leading to searching more or ruminating about their health related problem, over-thinking, stress, restlessness, sleeplessness depressed feelings and more confusion in more than a quarter of the participants. However, more than forty percent of participants also felt reassured and overwhelmed. The perception of the Internet search as a good option for finding solutions to health problems was positively associated with accuracy, accessibility, understandability of the found information, feeling reassured and sharing of the information with family and health professionals. The perception of the Internet search as a good option for finding solutions to health problems was negatively associated with taking problems more seriously.

The results of the study suggested that students use the Internet in various ways for health information seeking. Thus it becomes the prime duty of the country's governance to ensure the accuracy and reliability of the tremendous amount of information available on the Internet. The various stakeholders must get involved to improve the quality of the information by keeping a check on various websites and providing citations, references for the claims on Internet. Further, the institutions should come forward to provide training to their students for assessing health information through reliable websites by the health care professionals as the Internet is easily assessable at any time and any place and most of the time it is the first avenue to be explored by the students for their health problems. In India, where we have a lot of population burden over our health care facilities these little steps may work wonders in improving the delivery of health care to society. Thus strengthening of the Ayushman Bharat Digital Mission (an initiative under National Digital Health Blueprint, an action plan of National Health Authority, Government of India) by improving the Internet-based health information seeking behavior of the youth through education and various workshops must be the priority of the policymakers.

There were certain limitations as the study was carried out as a cross-sectional survey in a limited number of engineering students of Jodhpur city. So, generalization of the results to the students of various universities in different parts of the world can be challenging. The impact of online health information seeking on the mental health of the students needs further evaluation in a cohort design study.

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