

A Study on the Impact of Cyberchondria on the Indian Population

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Abstract: In this digital era, the Internet has become one of the primary health information sources. As a result, information is straightforward to obtain for little or no cost via the Internet. Another aspect is that much online information about health is available where results are obtained quickly, making people search about their health online very often. The Internet has become their first stop for learning more about health problems and symptoms for most people. Such repetitive or excessive searches for information related to health on the Internet empower some individuals to make medical choices to control and manage diseases. In contrast, others might get more anxious, which might affect their day to day life activities. To rely on online medical information, the quality of the content must be controlled and well-managed. People should be competent in discerning between credible and noncredible data sources on the Internet.

Keywords: Cyberchondria, Health information, Health searches, Internet, Public health.

I. INTRODUCTION

The Internet's ability to serve as a ubiquitous delivery method for medical searches and a recognized tendency for online health has shown an escalation in anxiety [1]. Exposed to such information obtained through web searches, particularly distressing, erroneous, and misleading health information regarding life-threatening illnesses might worsen existing concerns about these disorders/sicknesses, which in turn cause new fears, resulting in a repetitive loop of anxiety/discomfort and frequent visits on the Internet for health-related information which is referred to as the cyberchondria pattern [2].

The terminology 'Cyberchondria,' which combines the words 'cyber' and 'hypochondriasis,' is now commonly used to describe a habit of frequent, excessive, and maladaptive Internet use to get medical information [3]. Cyberchondria has a behavioural component that is unreasonable and frequent online health searches. This may be identical to attaining

confirmation, in which the individual wants confidence online rather than in person [2]. On the contrary, According to Lemire *et al.*, Users feel empowered (i.e., competent and in charge) when they engage in health-related web use [4]. It offers new possibilities for maintenance and preventive treatment that could be utilized as a warning system, for example, cancer [5].

II. LITERATURE REVIEW

A. Impact of the Digital Revolution

In the realm of the 5th technological uprising with digitalization and global networking [6]. How people communicate and network using digitalization is evolving daily, and the use of influential, powerful and dynamic technologies can impact the world [7]. Health care workers (HCW) simultaneously, technological advances are going uphill at a remarkable pace, while hardware and software rising are making room in health care, with this healthcare digitalization, the abundance of medical information and data available on the Internet has evolved quickly, and patients become empowered the info readily obtainable by the use of mobile phones with easy, affordable, abundant information available on the Internet these days, an enormous fraction of medical knowledge [8].

As the usage and addiction to smartphones are soaring, internet usage has gone up, and hence along with it, the cyberchondria-related anxiety level has also increased [9]. Internet is affordable at low cost, and Jio is coming up with long-term voice-over evolution (VoLTE) technology with higher speed internet than 2G and 3G [10].

Another reason could be. However, Innovations in computer science and information technology are encouraging us to deal with and interpret the enormous amount of health knowledge on the Internet; also, free access to clinical studies and protocols is becoming accessible. In addition to a significant amount of information, mobile health provides an option for self-care with certain limitations, such as the possibility of misinterpreted

data and the existence of questionable online resources that can lead to incorrect medical conclusions that are not based on the opinion of a medical expert and can even endanger a person's life. As a result, medical professionals and policymakers have an enormous responsibility to ensure that mobile health is used responsibly. Therefore, the well-operating of the patient-physician relationship is yet another crucial part of healing (Patients may turn to ineffective therapies and self-diagnosis because of decreased faith in the healthcare system) [8].

B. Benefits of Health Insurance

In the 2020 financial period, almost 500 million people across India were covered by health insurance [11]. The ageing of the population is a global sensation that nearly every country in the world is experiencing and reflects social and economic achievements. By 2050, people over 60 will be dwelling in developing regions. The ageing population significantly contributes to the nation's health and socio-economic development. In addition, reinforcing geriatric citizens is critical to achieving Sustainable Development Goal 3, which includes health and well-being. Therefore, promoting senior fitness is a significant concern, especially in developing countries, including India. Increased insurance awareness and facilities for good quality and subsidized health facilities will only strengthen the care for older adults and help them against the tax disaster [12].

Time gaps in insurance content are related to delayed care behaviour and more precarious health problems [13]. Combining health insurance in the country was essential to lower healthcare costs. Such things can be seen in countries like South Korea and Thailand, the benefit of linking health insurance to achieve universal health content has already been advocated [14] if the German statutory health insurance system is recognized as one of the prototypes of the ultramodern health system configurations. Germany's practical policy-making style, with its confined nation, manager of the fitness system, an approach that the solon is charging the equal actors with operating the issues that they created with inside the first vicinity that is, with calling the Federal Joint Committee, the principle self-governance organization of payers and providers, to outline regions for excellent enhancement via way of means of unique constricting and pay-for-performance [15].

Adding the information together, prolixity is a part of medical insurance, possibly specifically salient withinside the growing global in which the use of tertiary care is low and those who are sceptical approximately the blessings of treatment. Suppose that in these contexts' rational agents, in this case economically poor, calculate on an anecdotal basis or learn from the family's experience, musketeers, and neighbours - choosing the health service. Therefore, insurance convinced the increase in healthcare applications could significantly slip over goods of improved healthcare utilization. These slippage over-effects could also be relevant to similar scope conditioning, such as

the educational giants and health camps [16], as endogeneity of health insurance prevents unproductive conclusions about health insurance assets in the health care system from experimental studies [17].

C. E-Health Literacy: Information Transfer Makes it Easier and Simple

E-health is a rising field in the convergence of medical information, people's health, and business, implying healthcare utility and facts provided or improved with the help of the Internet and likewise technologies. In the broader sense, the term identifies a technical improvement, a frame of mind, a style of thinking, a mindset, and a dedication to utilizing information and communication technologies to improve health care locally, regionally, and globally [18].

The capability to search, identify, absorb, and evaluate health information from electronic sources and employ the information learned to resolve or treat a health problem is introduced and characterized as eHealth literacy [19].

In a countrywide poll of Internet users, 40% claimed to use the Internet for health-related searches; in the last year, 80% of youth Internet users have browsed for health advice, out of which 63% browsed about a particular disease, and 47% inquired for medical therapy [20]. It was also found in the European health literacy survey (HLS-EU) that each second individual had an insufficient amount of health literacy [21].

The way of utilizing the understanding and expanding information with the use of communication technology to enhance healthcare can significantly impact their health and their environment. It efficiently associates health consumers with the findings of the Internet. Still, there are some challenges in considering online health information which as the generalizability of results another aspect is ethical considerations in practice, as a wide range of information available should be appropriate. It should also have some standards set by the policymakers for improving an individual's health literacy on the positive side. As people become empowered by the knowledge, it reduces the system complexity on the Internet [22, 23].

D. Cyberchondria

Cyberchondria is a kind of anxiety described by an inordinate online medical search. It gives rise to unnecessary mental stress and medical expenditures. Different validated scales are used to measure analogous forms of anxiety, similar to health anxiety and general anxiety; CSS is one of them, which is a multidimensional construct evaluating anxiety, its compulsive nature, and the patient-physician relationship.

The CSS scale can also measure the psychometric aspects of anxiety caused by online health searches [23]. The German scale of CSS also possesses good psychometric characteristics,

and the factorial structure duplicated the association between stress and depression for the above scale, emphasizing their validity and applicability [24].

E. Impact of Cyberchondria on Health

The terms “health anxiety” or “Illness anxiety” are used interchangeably and might appear somewhat similar to hypochondriasis. However, we can consider health anxiety as a stressful form of hypochondria. Opinion of health anxiety has come to a beneficial generality and has attracted a decreased hobby within the ultimate five times. The centre capabilities of health anxiety are devilish solicitude over health and worry of growing criticism. Anxiety symptoms, including bodily symptoms, are misinterpreted as a validation of natural contamination.

Health anxiety is expected due to the tendency for people to be told to hide their health status and the destructive results of evil internet browsing on fitness-related topics. Still, it persists numerous times, leading to great suffering and disability. If it is untreated, assessment of Cyberchondria had been virtually severed, and most of the remedy validation became based on physical tension. Health anxiety and Cyberchondria seem to be phenomenologically related but distinct truths, and it may be helpful to interpret the two conceptions separately. Four demonstrated tone-evaluation measures for Cyberchondria are to be had in the literature [25].

Cognitive behaviour remedy (CBT) added both bodily or through the Internet (iCBT) were manufacturing unit to be robust for each fitness tension and Cyberchondria. Pharmacologic techniques for fitness tension have especially worried the use of Picky Serotonin Reuptake Impediments, suggesting powerful pills are superior for depression/anxiety [3].

People suffer from an intolerance of uncertainty (I.U.), a dispositional fear of the unknown, locate questions in large part distressing and interact in protection conduct to lessen analogous torture. Still, searching clinical statistics on the Internet has the implicit in resulting in decreased conditions of question and complicating fitness tension for individuals with excessive I.U. The dogmatism of the question must be mild, the connection between the frequency of Internet searches for clinical statistics and health [26].

Cyberchondria represents a not unusual place transdiagnostic sample in instances with OCD, Advertisements, and MDD with a diapason of inflexibility and shows a variable burden of illness, assisting the want for specific scientific concerns and interventions [27]. Cyberchondria and its affiliation with first-class lifestyles for this particular epidemic. This contagion has altered the lives of individuals worldwide, and its results will close for a protracted time. With all the manners completed to forestall the improvement of COVID-19 and meliorate bodily issues, inner fitness calls for instant care [28].

The cyberchondria theory has been generated to explain the anxiety aggravating online health-related quests. In other words, Cyberchondria is not only related to seeking information on health-related issues but also the mental effect we face after that. Now, it has become part of ultra-modern life. Line fitness-associated quests in Cyberchondria bring about ideal conditions of fitness tension in comparison to the needs of health. Particular interest paid to fitness-associated facts determined online might also contribute to growth in fitness tension and inspire a few human beings to keep coming again to the Internet to lessen stress through persevering with the quests. Not most effectively can the Internet supply disagree, nebulous, or incorrect facts regarding the hunt? However, it may be abstracting and cause different, probably tension-amplifying facts (e.g., facts approximately here to fore unknown situations or fitness pitfalls) [6].

Therefore, an interpretation of the superior rating of a few malice as a reason for the symptom that initiated a web hunt is usually in all likelihood to growth fitness tension. Also, the outcomes of hunt machines (e.g., Google) are possibly prejudiced in the direction of rare life-striking ails, which beget gratuitous solicitude or tension amongst information seekers. When human beings have enough functionality to gather, estimate and reuse colourful fitness facts online, they may be much less in all likelihood to increase Cyberchondria. This is because they may be frightened that the Internet is only a device to list feasible troubles approximately their hunt question and cannot diagnose their signs and symptoms scientifically and objectively [29].

Health information has been described because of the functionality to seek, find, understand, and estimate fitness facts from virtual sources, using the obtained data to pick out or smash a fitness-associated problem. In the flip sense, the exquisite affiliation between terrible emotions and passions of loneliness causes the excessive use of the Internet and its operation. Unemployed girls sense to expose superior emotional and fashionable loneliness, depression, tension, stress, and cyberchondriac signs and symptoms. In addition to acute responses of fear, women’s prominent bodily and personal signs and symptoms of tension cause special excessive, obsessive, or repeated fitness-associated quests on the Internet, no matter the ensuing torture and impairment of regular existence conditioning [30].

Health anxiety, compulsive-obsessive symptoms, and dogmatism are all associated with cyberchondria rigidity, with health anxiety constituting the most significant exact contribution. Depression and bodily signs and symptoms additionally prognosticated cyberchondria inflexibility. These findings have critical counteraccusations for exploration and medical practice [26].

F. Patient-Physician Relationship

As Internet operation increases encyclopedically, the Internet’s use for health is likely to increase as well. As the Internet has

progressed, individuals have expanded their use of it to learn about a disease or affliction, determine if special medical care is necessary, learn about available treatment choices, and seek peer support from others with similar illnesses [31].

It is very well understood that people glance at the symptoms on the Internet before visiting a doctor [32]. A survey conducted in Swiss said that 30% of patients who had full internet availability used to get online health-related information (HRI) before and after consulting the physicians. Consulting physicians is essential as it helps to decide the therapy's length and other related factors [33].

The information gained through the Internet also helps to understand the medical treatment better and explain the feelings better; hence, the treatment can again be patient-centric. The Internet has created a sense of insecurity and anxiety among physicians as the patient gets the information from the web and devalues the physician's advice, which might impact the relationship between the doctor and the patients [35, 36].

G. COVID-19 and Cyberchondria

The WHO has also emphasized the rapid spread of misleading information through different platforms, which poses a significant risk to public health [35]. As known, Cyberchondria is the redundant seeking of information available on the Internet, which is linked with raised degrees of stress and discomfort, all instances of PUI represent public health concerns and should be considered from a mental health perspective; Cyberchondria should be dealt with as exacerbated perception of threat can cause unwanted problems, control, and supervision of health information available on the Internet. In COVID-19 pandemic, the model of Cyberchondria clarifies the hypothesized increase in online health searches [36]. Cyberchondria was evaluated utilizing Cyberchondria Severity Scale (CSS), and positive associations were found between distress, anxiety, and Cyberchondria, although no correlation was observed between the hyperthymic temperament and Cyberchondria [37].

The relation between irresponsible internet usage and Cyberchondria, along with the fear of COVID-19, was

significantly channelled by anxiety sensitivity and metacognitive beliefs. As the fear of COVID-19 has been associated with Cyberchondria, sensitivity, and anxiety, the healthcare provider will need to provide add-on assistance to patients who suffer from cyberchondria and anxiety sensitivity [38]. To empower individuals and motivate them to adopt preventive care such as self-isolation and inform them about the severity of the situation [39].

During the pandemic COVID-19 has increased focus on the significance of mental health and behavioural sciences, which assist the medical and pharmaceutical sciences. They compensate for the lack of distribution in "effective prevention or treatment" by providing a safe guideline for collective and behavioural adjustment, which ultimately protects our health; in such a scenario, this should be the safe use of online health searches to improve public health and facilitate the well-being of an individual during and after COVID-19 [21].

III. METHODOLOGY

Survey Design of Research

a) Participants Selection - An online survey was conducted in November 2021 to study Cyberchondria and its effect on daily life activities. For this, an exhaustive literature survey was done. On the lines of the standard Cyberchondria severity scale (CSS) the questionnaire was generated as the survey was mostly conducted in foreign nations; the questionnaire was revised according to the Indian diaspora, and for this, personal interviews were conducted and by knowing their point of view certain questions were added in the questionnaire. A pilot run was done (Table I). At the end, the questionnaire was circulated to reach respondents through various social media platforms like WhatsApp and LinkedIn, etc. The survey questionnaire has the screening questions like "Have you ever googled (web search) any illness symptoms that you are facing (e.g. checking about signs of (COVID-19))" so the people who have experienced the cyberchondriac behaviour were only considered for further results and rest were eliminated from the study.

TABLE I: THE DEMOGRAPHIC INFORMATION AND CHARACTERISTICS OF STUDY PARTICIPANTS

Characteristics		Number of Respondents (N)	Percentage (%)
Age			
	18 - 25	396	94.28
	26 - 35	14	3.33
	36 - 50	7	1.66
	More than 50	3	.714
Gender			
	Female	237	56.42
	Male	183	43.57

Characteristics		Number of Respondents (N)	Percentage (%)
Online health-information seekers			
	Yes	340	80.95
	No	50	11.90
	Maybe	30	7.14
People worried after online health search			
	Yes	203	54.86
	No	62	16.75
	Maybe	105	28.37
Source of health information			
	Top related searches	232	75.32
	Specific websites	76	24.67

The Table shows the Demographic data of the participants: 94.28% of respondents were aged between 18-25 years, 3.33% lay between the 26-35 age group, 1.66% were between the 36-50 age group, 0.714% of respondents were more than 50 years of age, 237 representing (56.42%) of the respondents were Female and 183 representing were Male (43.57%), 80.95% of participants seek for online health information, 54.86% people get worried after online health search, 75.32% participants look for top related searches as a source of health information.

b) Measures for Analysis - The Likert scale and multiple-choice grid were adopted for recording responses. Above mentioned type of question was generated to carry forward the research. Of the 420 respondents, 308 were considered in our study, as the rest were screened from the screening question. The sample size is considerable for the application of CFA and SEM [40].

TABLE II

The Minimum Size of the Sample	No. of Factors	No. of Observed/Manifest Variables Per Factor/Construct	Communalities
100	Five or fewer	Three or More	0.6 or higher
150	Seven or fewer	Three or More	Modest level (0.5)
300	Seven or fewer	<3 (few out of 7)	Lower level (<0.45)
500	Large number	<3 or three or equal to 3	Some with lower level

IV. DATA ANALYSIS

The study had different variables in the data set; KMO and Bartlett's tests (Table III) were done to check the correlation and factorize the variables before the actual factorization was done. The KMO (Kaiser-Mayer-Olkin) test was done to see if the sample data was good enough to do factor analysis, and the P-value was found to be more than 0.7 (>0.7), which means

that the sample data is good enough to do factor analysis. The understudy data was found to have a commonality value of more than 0.5, which says that the data will be able to explain more than 50% of the variance in the given data set. Altogether the sample has a significant value of more than 1.0 (> 1.0), which further supports the exhaustive factor analysis of the generated values in (Table IV).

TABLE III: KMO AND BARTLETT'S TEST OF FACTOR ANALYSIS

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.813
Bartlett's Test of Sphericity	Approx. Chi-Square	962.261
	df	55
	Sig.	.000

*The KMO test measures the sampling adequacy; the KMO value was ($p > 0.05$), the sample was sufficient for applying the factor analysis, and Bartlett's test of sphericity tests whether the correlation matrix was an identity matrix or not. Bartlett's Test of Sphericity was significant.

TABLE IV: ROTATED COMPONENT MATRIX, COMMUNALITIES, RELIABILITY

	Factor Loadings	Communalities	Cronbach's α
Mental Relaxation			
Leisure Time	0.765	.714	0.781
Sleep	0.784	.704	
Daily Routine			
Family Time	0.736	.728	0.791
Eating Habits	0.52	.686	
Literacy			
Academics	0.766	.690	0.438
Multiple Websites	0.833	.648	
Belief			
Awareness	0.76	.482	0.8
Trust	0.823	.698	
Online Search	0.85	.728	
Physicians	0.811	.731	
Faith in Doctors	0.818	.602	

Principal component analysis, **NOTE: Loading Values are taken above value 0.5 and depict communality >0.5 explains more than 50% of the variance of the data.

The above Table is the result of the tests performed in IBM SPSS V 22 Software, where factorized data was fed into IBM SPSS V 23 Software to perform the Confirmatory Factor Analysis (CFA) along with the structural equation model on the theoretically hypothesized model of the variables to check the correlation between the exogenous and endogenous variable of the model

and to determine what factors are having a particular impact on various variables in ophthalmology (Fig. 1). For this purpose, Cronbach's alpha (Table V) values are examined to ensure that the grouped factors are strongly related and correlated; the values obtained supported and offered a favourable indication that CFA should be used in our research.

TABLE V: VARIABLES AND FACTORS

Latent Variable	Sub Variable	Abbreviation
Mental Relaxation		
	Leisure Time	L.T.
	Sleep	S.P.
Daily Routine		
	Family Time	F.T.
	Eating Habits	E.H.
Literacy		
	Academics	Acad
	Multiple Websites	M.W.
Belief		
	Awareness	E.A.
	Trust	T
	Online Search	OH
	Physicians	PC
	Faith in Doctors	B.D.

To carry out CFA and demonstrate that the model is a good fit, the hypothesized path diagram was drawn in AMOS Graphics software to check the association among different variables. All endogenous and exogenous variables are placed, and the

error variables are also applied to the required variables. The variables were connected with the arrows to test the theoretically assumed model after that variable was correlated by clicking with the help of plugins to try our research study [41].

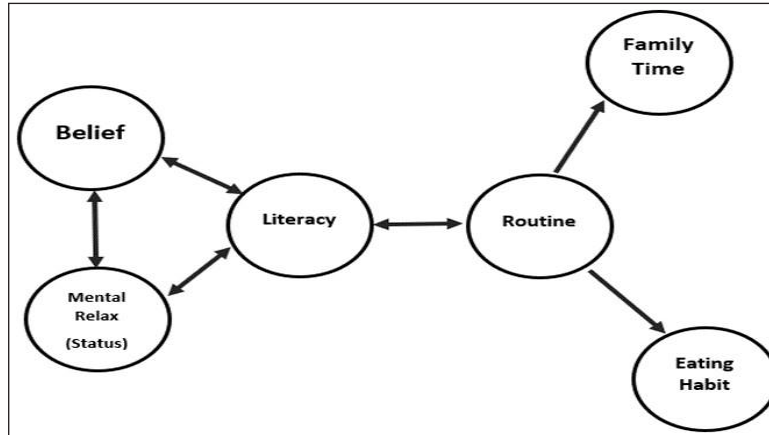


Fig. 1: Schematic Representation of the Hypothetical Model to Determine Factors Influencing Cyberchondria

After performing the tests, the loading number were screened on the arrows to check the model fit. For that, statistical values were limited, and CFI (Comparative Fit Index), RMSE (Root Mean Square Error), and TLI (Tucker Lewis Index) values should come around the ideal weight to be confirmed as the best fit. The desired model was generated, and the statistical values for

model fit parameters were checked. The comparative fit index (CFI) is 0.933, Tucker Lewis Index (TLI) is 0.833, and RMSEA 0.059 signifies that the model has achieved a satisfactory result to be called a model fit. And the significant probability level was reached ($P = 0.001$) [43, 45]. After CFA, the SEM model was prepared and run, as shown below:

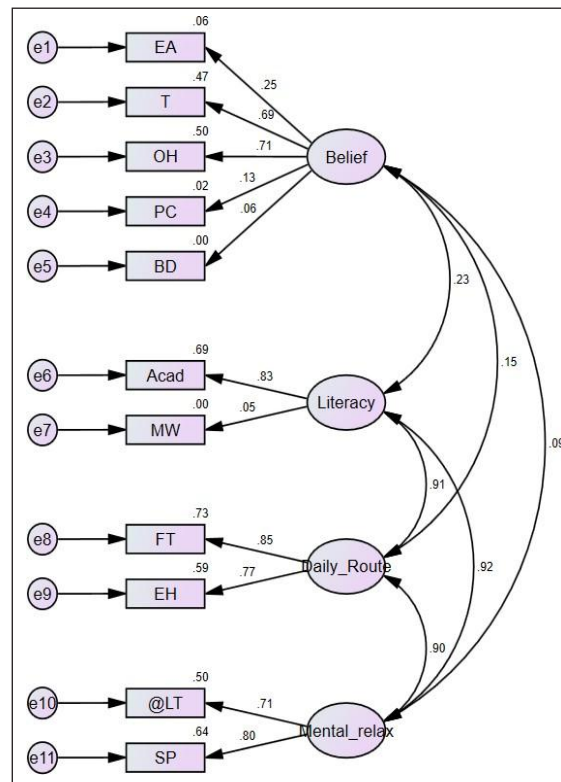


Fig. 2: Amos Diagram Showing Different Factors

V. RESULTS

The above results in (Table VI) was generated after the analysis was performed in AMOS. The variables have a significant impact on each other with a 95% confidence interval as it is substantial as the P significance value is 0.001, which is depicted by the ‘*’ asterisk mark. Using SPSS and AMOS software, our findings suggest the Internet is a place where there is abundant health information present and with such information either fear elevate and amplified or diminished based on information they found. Irrespective of whether the report found relevant to what they were searching for or not, cyberchondriac individuals look for online health information available for their health condition

and have trust in results so procured from the internet source and rely on it; this was significantly proven in our study through the statistical test and evident from P value so obtained, also when a person is experiencing anxiety or implicit cyberchondriac behaviour it affects the mental health of an individual which have an impact on specific changes in behaviour which causes stress discomfort to an individual, it offsets a person to sleep distortion and affects the sleep time duration, further cyberchondriac individuals that are experiencing stress or pain due to online health search results tends to have an impact on their day to day activities such as eating habits which could be either skipping of meals or overeating.

TABLE VI: TABLE SHOWING ESTIMATES OF DIFFERENT FACTORS (CONFIRMATORY FACTOR ANALYSIS)

			Estimate	S.E.	C.R.	P
OH	<---	Belief	2.832	0.861	3.29	0.001
T	<---	Belief	2.64	0.862	3.063	0.002
EH	<---	Daily_R	0.911	0.064	14.158	***
SP	<---	M_Relax	1.047	0.073	14.288	***

NOTE: P ≤ 0.05 statistically significant, * P ≤ 0.001 (Strongly Significant)

VI. LIMITATIONS

- In our study, most of the respondents are from the adult population, and different age groups could have widened the scope of the study.
- Our study did not include ailments/disease people search for on the Internet and the source of information.
- The frequency of searching for symptoms on the Internet was not evaluated.

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