INTRODUCTION

The generation of today is heavily dependent on the internet for information needs which has propelled India to second spot in terms of internet users after China and with 560 million active users. Furthermore, statistics reveal that nearly three fourths of India’s online population is under 35 years of age.\textsuperscript{1}

Before the advent of internet, patients relied heavily on their physicians for health based information and treatment modalities. But now, with easy access to information available on the web, patients are getting more knowledgeable regarding their health and at times, question the attending doctors about procedures and alternate options. In India, there were an estimated 72\% of people who acknowledged the fact that they surfed the internet looking for health-related information out of which, a whopping 95\% of the population found the information available on the internet serving their purpose.\textsuperscript{2}

Searching for health-related information on the internet by patients has quite a few advantages for them. It helps them increase their knowledge, competence, and engagement in health maintenance and decision-making, whilst also providing an opportunity to investigate difficult or embarrassing questions with comfort and privacy.\textsuperscript{3,5} Patients also appreciate the freedom afforded by ready access to online health related sites, articles or resources, which reduces the time and commitment for office-based physician consultations. Also, the Internet provides space (anonymous, if required) to majority of patients who finding themselves in similar medical situations/conditions, and hence, helps in generating a strong, highly accessible base of care, as well as to understand and to provide support to individuals with similar issues related to their health.\textsuperscript{5}

Hence, this study tries to assess the impact of internet on health related behaviours of patients and its impact on the physician-patient relationship amongst patients visiting various dental clinics in Northern India.

MATERIAL AND METHODS

Data was collected from the questionnaire adopted by Iverson SA et al.\textsuperscript{6} After adapting the questionnaire...
according to the Indian population, the questionnaire was Pre-tested on 50 people for its content and criterion validity. After making minor adjustments, the Questionnaire was distributed online to as many patients visiting various dental clinics Northern India who gave a written consent to be a part of the study. Dentists having clinics in Northern India were contacted, asked to participate in the study and their patients were asked to fill the questionnaire through the Quick Response (QR) code of the clinic posted in their clinic. The patients’ consent to participate in the study (inclusion criteria) was implied when they clicked on the “next” button to answer the questionnaire and they had complete freedom either to decline or answer the questionnaire. Access to data was only to the principal investigator and no personal details (e-mail id, phone number, name etc.) were asked. Responses were sought from only those patients who had had basic access to internet, were aged 18 and above, surfed the internet for at least 4 hours per week and could speak English fluently (inclusion criteria) and a submission was only considered when the “submit” button was clicked at the end of the questionnaire (inclusion criteria). Among total submissions, if a dentist failed to answer ≥1 question, it was excluded from the analysis. (Figure 1)

Data was analysed using SPSS version 21.0. Descriptive statistics was applied and the Chi-square test was done to find out associations among different age groups.

RESULTS
A total of 456 adequately filled questionnaires were identified from the 600 questionnaires distributed, leading to a response rate of 76%. The responses were subsequently tabulated and analyzed.

Demographic data of study population (Table 1)
The study comprised of 51.3% males and 48.7% females respectively divided amongst different age groups. Most of the people (37.9%) visiting the college were 30-45 years of age. The majority of the population (73.2%) visited the dental college themselves as compared to just 17.69% of the people who accompanied someone for their treatment.

Responses of the various age groups to the questions asked in the survey (Table 2)
There were a total of 400 (87.7%) internet users, majority (45.5%) of them belonged to 18-30 years age group while the least (7.2) belonged to the age group of ≥61 years of age. Of the 12.3% of non internet users, most of them belonged to the age group of ≥61 years (42.9%). When enquired whether the internet users were able to find answers to their health related questions online, a total of 121 (30.3%) and 171 (42.8%) of the users replied “yes” and “somewhat” respectively, whereas 108 (26.9%) people were unable to find answers to their health related questions. A statistically significant difference was seen among all age groups who answered “yes” to a particular question (p=0.01).

The third question, which selected information on whether respondents experienced changes in thinking about health as a result of online information, the age group of 18-30 years replied in the affirmative which was significant when compared to other age groups (p=0.03).

Behavioral changes due to online information was seen most in the 18-30 years age group (30.0%), but only 15.9% of them informed their physician about such changes. The same trend was seen among the age group of 45-60 years where 41.1% of the respondents did not inform their physicians about such behavioral changes. No statistical significance was observed among the age groups, respectively. When it came to discussing online
health information, only the respondents between age groups of 46-60 years (41.1%) believed that their physician was willing to discuss online information with them. The difference in opinion among other age groups did not show any statistical significance.

Most internet users (10.6%) followed their physician’s advice before they began using the internet. While only 9.8% followed their physician’s advice “most of the time.” No statistical significance was seen among the different age groups.

Amongst non-internet users (n =56) the main reason was that most of them did not trust internet information (30.6%).

**DISCUSSION**

In an effort to assess the impact of internet on the patient-physician relationship, it was found that a total of 57.35% of the study population belonged to the “internet users” group who surfed the internet for most of their basic needs and out of these “internet users”, a total of 67.4% of the population were able to find answers to their health questions online.

Males made up a slightly higher proportion compared to females seeking health information from the internet. This was in contradiction to various studies where a higher response rate was seen amongst women who sought more health related information when compared to males.6,8,9,10

This study found that internet usage decreased as age increases, and this was found to be in agreement to various studies.6,8,9,10,11,12 It was also noted that although a higher percentage of internet users were amongst the age group of 18-30 years, the possibility of their main use of the internet could be limited to socialising and entertainment, whereas older age groups specifically focus their internet usage on seeking health related information which was in agreement with this study.13

This study also revealed that only 30% of the respondents were willing to discuss online information with their physicians. This is in line with studies conducted by Ahmad FL et al. and Chestnutt IG et al. who also reported low willingness of patients to discuss information with their physicians.14,15 Contrary to such results, Giveon et al. and Nili T el al. reported a positive attitude of respondents in discussing such information with their physicians.16,17 It might be speculated that factors which can influenced patient-physician communication are the fear and anxiety levels of the patient, excessive work burden of the physician, the inherent fear of litigation by the patient, a possible fear of physical or verbal abuse coupled with unrealistic expectations lead the patient to seek help from easily available online health related information privately and securely.18

Majority of the non-internet users(56.2%) did not search the internet for health related information as thought that they were already adequately informed. This study also did not aim to investigate their source of information which could range from reading medical magazines to believing in the hear-say of their peers and/or getting knowledge from people/ family members getting treatment for similar conditions. 1.5% of the population were “uncomfortable” with the internet, which could be due to inability to keep pace

| Characteristic       | AGE GROUP (n,%)                       | Total (n,%) |
|----------------------|---------------------------------------|-------------|
|                      | 18-30 | 30-45 | 45-60 | ≥60 |             |             |
| Gender               |       |       |       |     |             |             |
| Male                 | 12(41.4) | 99(57.2) | 54(42.2) | 69(54.8) | 23(51.3) |
| Female               | 17(58.6) | 74(42.8) | 74(57.8) | 57(45.2) | 22(48.7) |
| Total                | 29(64.4) | 173(37.9) | 128(28.1) | 126(27.6) | 456(100) |
| Reason for visit     |       |       |       |     |             |             |
| For own treatment    | 16(55.2) | 135(78) | 99(77.3) | 84(66.6) | 334(73.2) |
| Accompanying         | 13(44.8) | 38(22) | 29(22.7) | 42(33.4) | 122(26.8) |
| Someone              | 29(6.4) | 173(37.9) | 128(28.1) | 126(27.6) | 456(100) |

**Table 1. Demographic data of the Study Population**
with evolving technology and which could be solved in due course of time depending upon the individual’s interest to learn. A minute percentage (5.4%) of the respondents did not trust the information on the internet.

Certain authors have stated that the availability of health information on the internet is generally beneficial for the patients. In contradiction to certain authors who rationalise that the interpretation of medical based information requires an acquired skill which patients often lack. The widespread availability of such information through the worldwide web, may fulfil the patients’ search for knowledge, but they may fail to recognise that certain important information might be missing or they might fail to acknowledge the biased content of the information they obtain. Failure to recognise non-evidence-based material by patients with a potential

| QUESTIONS                                                                 | AGE GROUP (IN YEARS) | 18-30 | 31-45 | 46-60 | ≥61    | Total  |
|---------------------------------------------------------------------------|----------------------|-------|-------|-------|--------|--------|
| Internet users                                                             |                      |       |       |       |        |        |
| I am able to find answers to my health questions online                    |                      |       |       |       |        |        |
| - Yes                                                                     |                      |       |       |       |        |        |
| - Somewhat                                                                |                      |       |       |       |        |        |
| - No                                                                      |                      |       |       |       |        |        |
| I have experienced changes in my thinking about health as a result of online information |                      |       |       |       |        |        |
| - Yes                                                                     |                      |       |       |       |        |        |
| - No                                                                      |                      |       |       |       |        |        |
| I made behavioural changes as a result of online information              |                      |       |       |       |        |        |
| - Yes                                                                     |                      |       |       |       |        |        |
| - No                                                                      |                      |       |       |       |        |        |
| I informed my physician about these behavioral changes                    |                      |       |       |       |        |        |
| - Yes                                                                     |                      |       |       |       |        |        |
| - No                                                                      |                      |       |       |       |        |        |
| I believe my physician is willing to discuss online information with me   |                      |       |       |       |        |        |
| - Yes                                                                     |                      |       |       |       |        |        |
| - No                                                                      |                      |       |       |       |        |        |
| I followed physician’s advice before I began using the Internet          |                      |       |       |       |        |        |
| - Always                                                                  |                      |       |       |       |        |        |
| - Most of the time                                                        |                      |       |       |       |        |        |
| - If advise made sense                                                    |                      |       |       |       |        |        |
| - Made up own mind                                                        |                      |       |       |       |        |        |
| - Seldom                                                                  |                      |       |       |       |        |        |
| Non-internet users, N (%)                                                 |                      |       |       |       |        |        |
| Reasons for not using the Internet to locate information about health online |                      |       |       |       |        |        |
| - Already adequately informed                                             |                      |       |       |       |        |        |
| - Use other resources                                                     |                      |       |       |       |        |        |
| - No internet access                                                      |                      |       |       |       |        |        |
| - Uncomfortable with internet                                            |                      |       |       |       |        |        |
| - Do not trust internet information                                       |                      |       |       |       |        |        |
| Total                                                                     |                      |       |       |       |        |        |

Table 2. Responses of The Various Age Groups to The Questions Asked in The Survey
for misinterpretation of some of the medical information might lead to serious health concerns.22

LIMITATIONS
This study is prone to certain limitations which are:
1. The self-reported nature of data leads might have led to social desirability bias, recall bias or respondent bias.
2. It is possible that patients using the internet filled out the surveys more than those not using the internet.
3. Like this study, majority of the studies assessing the impact of internet on patient-physician relationship collected information at once (cross-sectional in nature). But mostly, physician-patient relationships are mostly long term which involve multiple visits, and this may limit the generalizability the results.23

CONCLUSION
With the ever changing patterns of internet usage, it is important that patients be advised pertaining to the misleading nature of information present on the internet. It is equally important that physicians work towards elimination of barriers that might hamper an effective communication with their patients. With today’s younger generation being short on time and having instant internet access on the go, it is important that they, in particular, be made aware of the potential harm any misleading information can create on their health and unnecessarily add to the global burden of disease.

REFERENCES
1. Statista. Internet usage in India - Statistics & Facts [Online article] (https://www.statista.com/topics/2157/internet-usage-in-india/). [Last Accessed on 20th January, 2020]
2. Akerkar SM, Kanitkar M, Bichile LS. Use of internet as a resource of health information by patients: A clinic based study in the Indian population. J Postgrad Med 2005;51(2):116-8.
3. Epstein RM, Alper BS, Quill TE. Communicating evidence for participatory decision making [review]. JAMA. 2004;291:2359-66.
4. Cancer patients use Internet extensively; May 7, 2004. CancerConsultants.com Oncology Resource Center Web site. Available at: http://patient.cancerconsultants.com/CancerNews.asp?DocumentId=23590.
5. Hardey M. Doctor in the house: the Internet as a source of lay health knowledge and the challenge to expertise. Sociol Health Illn. 1999;2:820-35.
6. Iverson SA, Howard KB, Brian K. Penney BK. Impact of Internet Use on Health-Related Behaviors and the Patient-Physician Relationship: A Survey-Based Study and Review. J Am Osteopath Assoc December 2008;108(12); 699-711.
7. IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp.
8. Fox S. Health Information Online. Washington, DC: Pew Internet & Amer-ican Life Project; May 17, 2005.
9. Smith-Barbaro PA, Liciardone JC, Clarke HF, Coleridge ST. Factors associated with intended use of a Web site among family practice patients. J Med Internet Res 2001;3:E17.
10. Houston TK, Allison JJ. Users of Internet health information: differences by health status. J Med Internet Res 2002:4:E7.
11. Campbell RJ, Harris KD, Wabby J. The Internet and locus of control in older adults. Proc AMIA Symp. 2002:96-100.
12. Cutler SJ, Hendricks J, Guyer A. Age differences in home computer avail-ability and use. J Gerontol B Psychol Sci Soc Sci. 2003;58:S271-S280.
13. Jones S, Fox S. Generations online in 2009. Pew Internet & American Life Project, January 28 2009. http://pewinternet.org/Reports/2009/GenerationsOnline-in-2009.aspx
14. Ahmad FL, Hudak P, Bercovitz K, Hollenberg E, Levinson W. Are physicians ready for patients with internet-based health information? J Med Internet Res 2006:298:22-30.
15. Chestnutt IG, Reynolds K. Perceptions of how the Internet has impacted on dentistry. Br Dent J.2006;3:161-5.
16. Giveon S, Yaphe J, Hekselman I, Mahamid S, Hermoni D. Thee-patient: a survey of Israeli primary care physicians’ responses to patients’ use of online information during the consultation. Isr Med Assoc J 2009;11(9):537-41.
17. Nili T, Moti M, Avner C. Dentists’ attitudes toward discussing Internet health information with their patients – does professional self-efficacy matter?. Journal of Public Health Dentistry 2011; 71; 102-5.
18. Fentiman IS. Communication with older breast cancer patients. Breast J. 2007;13(4):406–9.
19. Hart A, Henwood F, Wyatt S. The role of the Internet in patient-practitioner relationships: findings from a qualitative research study. J Med Internet Res 2004:6:e36.
20. Potts HW, Wyatt JC. Survey of doctors’ experience of patients using the Internet. J Med Internet Res 2002;4:e5.
21. Sacchetti P, Zvara P, Plante M K. The Internet and patient education – resources and reliability: focus on a selected urologic topic. Urology1999; 53:1117–1120.
22. Ayonrinde O. Patients in cyberspace: information or confusion? Postgrad Med J 1998; 74:449-450.

23. Ha JF, Longnecker N. Doctor-Patient Communication: A Review. The Ochsner Journal 2010;10:38–43.

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