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Internet Diagnosis Among Undergraduates: Prevalence, Perceptions, And Implications for Healthcare Practices at Niger Delta University

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Abstract
The increasing reliance on internet-based health information has transformed healthcare-seeking behaviors, particularly among university students. This study explores the prevalence, perceptions, and implications of internet diagnosis among undergraduates at Niger Delta University (NDU). Utilizing a cross-sectional survey design, a sample of 411 respondents was selected using a combination of purposive, cluster, and accidental sampling techniques. Data were collected through a structured questionnaire and analyzed using descriptive statistical methods. Findings reveal that a significant proportion (88.1%) of undergraduates have used internet diagnosis, with 76.9% confirming its widespread adoption within the university community. The study further identifies key sources of information on internet diagnosis, including accidental online exposure (43.1%), peer recommendations (29.9%), and social groups (16.3%). Additionally, 87.6% of respondents reported recommending online symptom checkers to others. While the majority (88.9%) perceive internet diagnosis positively and consider it a viable alternative to conventional healthcare, concerns persist regarding its accuracy. The study highlights the need for digital health literacy initiatives to ensure responsible usage of internet diagnosis while mitigating misinformation risks. The findings provide valuable insights for healthcare policymakers, educators, and digital health advocates in shaping interventions that enhance students' health-seeking behaviors.

Introduction

The rise in smartphone users and internet accessibility has brought about a significant shift in how people access information, particularly in the realm of health. According to Clark (2020), there are an increasing number of individuals, approximately 80% of patients, who now turn to the internet for health-related information, enabling them to engage in self-diagnosis. The younger generation, especially undergraduates, spare no effort in expressing their help-seeking behaviors concerning internet diagnosis and self-medication. This trend has led millions of people, especially those living in urban areas, to turn to a new kind of online software called symptom checkers. Symptom checkers are online applications that enable users to self-diagnose their symptoms and receive advice on whether they should seek further medical care or just rest at home until they feel better (Jake, 2015).

With several scholars advocating for the use of online health applications, there has been an increase in the number of young people, especially undergraduates, who subscribe to this school of thought. Their access to the internet is almost unrestricted, contributing to the rising statistics of online self-medication users globally (James et al., 2006). In addition to the inadequacies of health systems and service providers, particularly in developing countries, online diagnosis and self-medication appear to be the preferred choice for younger individuals. Several scholars have emphasized the significance of self-medication, considering it an essential component of the healthcare system and noting its widespread practice (Mukhtar, 2018; Albawani et al., 2016; Al-Flaiti et al., 2014; James et al., 2006; Jassim, 2010; Selvaraj et al., 2014; Sharif et al., 2015).

Pathetically, the underlying issue with self-medication is its detrimental consequences resulting from end-users who may misguidedly use it. Evidently, many undergraduates opt to address their common health issues through self-medication due to its ease, cost-effectiveness, and time efficiency (Keshari et al., 2014; WHO, 2000).

De Boer et al. (2007), Sawalha (2008), and Worku and Mariam (2003) confirmed that the use of self-medication is influenced by various factors, including personal, organizational, and environmental aspects. Bond and Hannaford (2003) and Klemenc-Ketis and Kersnik (2011) identified factors contributing to the prevalence of self-medication, such as media, the internet, and extensive pharmaceutical advertising. Moreover, inadequacies in healthcare delivery systems, particularly in low-income countries, like inaccessibility, unregulated medicine distribution, insufficient healthcare professionals, high costs, and patient attitudes towards healthcare providers, are significant drivers of self-medication (Esimone et al., 2007; Yousef et al., 2008).

While various factors contribute to the increased rate of online self-diagnosis, the act itself could be a major reason for the indiscriminate use of medicines (Filho et al., 2004). Internet diagnosis leading to self-medication, on the other hand, may result in adverse drug effects, development of resistance, medication dependence, wastage of money, and prolonged symptoms (Hughes et al., 2001). Concerning antimicrobial self-medication, common problems include inadequate dosage, short treatment duration, stopping treatment once disease symptoms improve, sharing medications, among others, leading to therapeutic failure (Bennadi, 2013; Skliros et al., 2010).

As risky as it appears, online self-diagnosis has become a social problem ingrained in human culture over the years, giving rise to various conceptualizations by different scholars, from simple definitions to more complex ones. Simply put, 'self-medication' is a way of treating common health problems with drugs specifically designed and labelled for use without medical supervision, approved as safe and effective for such use (World Self-Medication Industry, 2008). From a different perspective, online self-diagnosis is viewed as the process where individuals take on more responsibility for managing minor ailments by using any medication available to them without a prescription. Spanning various health-seeking behaviors, online self-diagnosis leads to various forms of self-medication, including herbal remedies, retaining and reusing prescription medications, or directly buying prescription-only medicines without medical guidance.

Additionally, online self-diagnosis encourages consumers to use various medications to address self-identified disorders, symptoms, recurring illnesses, or minor health issues (Afolabi, 2008).

Looking at it from a more complex perspective, online self-diagnosis presents the issue of using drugs to treat self-diagnosed disorders or symptoms, or the continued use of prescribed medication for chronic or recurring diseases or symptoms (Omolase et al., 2000; WHO, 2000). Hughes (2001) emphasized that self-medication involves using medication (modern and/or traditional) for self-treatment without consulting a physician for diagnosis, prescription, or treatment monitoring. Interestingly, the way self-medication is practiced often mirrors the essential health-seeking behavior of individuals, including obtaining medication without a prescription and taking medicines based on advice from friends and relatives. Self-medication is common in both developed and developing countries but is more prevalent in developing countries due to the wider availability of drugs without a prescription (Klemenc-Ketis, 2010).

It's crucial to consider the impact of the digital age on internet diagnosis. The rise of internet diagnosis has significant implications for the healthcare system. On one hand, it can help ease the burden on overwhelmed healthcare facilities and professionals by empowering individuals to manage minor health issues independently and seek proper care when needed. This approach can reduce unnecessary visits to emergency rooms and clinics, allowing resources to be allocated more efficiently for urgent cases, thus enhancing overall healthcare system effectiveness. However, internet diagnosis may strain the healthcare system by increasing the demand for medical services based on self-perceived symptoms or conditions. This heightened demand could lead to unnecessary consultations, diagnostic tests, and treatments as individuals seek validation or reassurance from healthcare providers. Additionally, the information gap between patients and providers, exacerbated by the abundance of online medical information, can complicate clinical interactions and impede effective communication and shared decision-making.

The expansion of telemedicine and virtual care platforms has blurred the distinction between traditional healthcare delivery and internet diagnosis, with more people opting for remote consultations and online services for diagnosis and treatment. While telemedicine provides convenience and accessibility for individuals in remote or underserved areas, it also raises concerns regarding the quality and safety of medical care provided through digital channels. It is essential to ensure proper regulation, oversight, and adherence to ethical standards in telemedicine to uphold the credibility and reliability of healthcare services in this digital era.

In order to broaden the scope of the study, the following specific objectives shall be investigated:

1. To find out the perception of undergraduate students in Niger Delta University who use internet diagnosis.
2. To investigate some social factors responsible for the use of internet diagnosis among undergraduate students in Niger Delta University.
3. To examine the types of health information, symptoms and diagnosis frequently used by undergraduate students in Niger Delta University

4. To ascertain the possible positive impact of internet diagnosis among undergraduate students in Niger Delta University.
5. To examine the risks of online diagnosis among undergraduate students in Niger Delta University.

Theoretical Framework

The Self-Determination Theory (SDT), developed by Ryan and Deci (2000), served as this study's primary theoretical model. In discussing undergraduate students' help-seeking behaviour, particularly regarding internet diagnosis and self-medication, the theory of Self-Determination (SDT) by Edward Deci and Richard Ryan (2000) is employed. These theorists developed the Self-Determination Theory (SDT) to explain and challenge the traditional notion that rewarding behaviour is the best way to motivate individuals. They proposed that all humans have autonomy and that the course of their lives is shaped by the choices they freely make for themselves.

Self-determination is a concept that pertains to an individual's capacity to make decisions and govern their own life. This capability significantly influences psychological health and well-being. Self-determination empowers individuals to feel a sense of control over their decisions and existence. Moreover, it influences motivation; individuals are more driven to act when they believe their actions will impact the results.

Some of the scholars who first applied SDT were Peters, Calvo, and Ryan (2018). They utilized SDT to elucidate how digital technologies can enhance mental health and well-being. However, in our current study, the focus shifts to exploring online help-seeking concerning internet diagnosis and self-medication.

Self-Determinism Theory includes various mini-theories, one of which is the cognitive evaluation theory. This theory suggests that there are three fundamental psychological needs for well-being and motivation: autonomy (having the freedom to choose in alignment with personal interests and values), competence (being able to effectively interact with the environment and showcase abilities), and relatedness (feeling a sense of belonging). SDT argues that these three basic needs are crucial for understanding why and how individuals pursue specific goals. It posits that humans naturally gravitate towards vitality, integration, and health and emphasizes that environments can either support or hinder these needs, thus impacting well-being and motivation (Ryan & Deci, 2000).

The self-care theory, proposed by Dorothea Elizabeth Orem in 1971, aligns with the theory mentioned earlier. Dorothea defines 'self-care' as a learned behavior or activity oriented towards well-being. It involves actions individuals take in real-life situations to manage factors affecting their own development and functioning for the sake of life, health, or well-being. This model emphasizes self-care activities, which are the tasks individuals initiate and perform to sustain life and well-being. These activities play a crucial role in maintaining and enhancing structural

integrity, functioning, and development. Self-care requisites represent the purposes aimed at achieving desired outcomes through intentional involvement in self-care.

Dorothea Orem, in 1971, categorized self-care requisites into two main groups: Universal self-care requisites, Health deviation self-care, and Health development self-care. According to Dorothea, these categories encompass the demands and actions necessary to meet the basic needs of daily living. They address the fundamental requirements common to all individuals for sustaining life processes. In the context of health deviation self-care requisites, Dorothea focuses on individuals, who are unwell, injured, or have a pathological condition and are under medical care. She highlights that these illnesses or injuries impact not only specific structures or physiological mechanisms but also overall human functioning, including the modification of self-concept and acceptance of the condition.

Application of the Theories

Based on the theories discussed, it's evident that the prevalence of internet diagnosis and self-medication among undergraduates aligns with the Self Determination Theory. The Self Determination Theory suggests that self-medication is a part of the self-care process. It indicates that the decision to engage in internet diagnosis and self-medication is a personal choice made by individuals, including undergraduates, to address their health concerns and improve their well-being. Therefore, seeking help through various means, including self-medication, is viewed as a natural and functional aspect of human behaviour.

Materials and Methods

The study was carried out at the Niger Delta University (NDU) utilising a cross-sectional design. The population of study consisted of full-time undergraduates at Niger Delta University. The Academic Unit of Niger Delta University in 2023, the total number of undergraduate students for the 2022/2023 academic session was reported as 8,776 for males and 9,383 for females, totalling 18,159 students. Using the Yaro Yemeni's formula and an attrition level 5%, the sample size for the study is 411.

The study utilized non-probability sampling techniques to select an unbiased sample. Firstly, purposive sampling was employed to choose six faculties out of the twelve at NDU, including Sciences, Education, Social Sciences, Management Sciences, Basic Medical Sciences, and Arts. Secondly, cluster sampling was used to categorize the population into faculties, and random sampling was used to select departments within each faculty. Accidental sampling was also used to select individual respondents within the departments. Lastly, purposive sampling was used to locate each respondent within their department or area in the study.

To empirically explore the variables related to the research problem, primary data for this study was collected using a questionnaire. The questionnaire was customized to align with the specific study objectives, with each objective represented in the sections of the questionnaire design. To

assess the reliability of the research instruments (questionnaire), a pilot study was carried out with 10% of the sample size, totalling 41 respondents. It's crucial to note that these 41 respondents were inadvertently selected from other institutions that are not part of the proposed faculties/departments where the study instruments were ultimately administered. After the pilot study was conducted, the collected data was analysed using Cronbach's Alpha with the assistance of the Statistical Package for the Social Sciences (SPSS). Based on the reliability statistics, the Cronbach's alpha [α] result of 0.695, rounded to 0.7, indicates that the instrument for the study is reasonably reliable with a moderate level of internal consistency. To further validate the key variables in the measure, face validity was utilized along with suggestions from colleagues.

The analysis method started with univariate analysis using Simple Percentage and Frequency Distribution tables to assess individual variables In line with research ethics, the study will prioritize the following ethical considerations: Informed consent, confidentiality, non-maleficence, and beneficence.

Results

Socio-Demographic Profile of Respondents

Table 1 provides a detailed overview of the respondents' socio-demographic profile. The survey revealed various age categories among the respondents: 14.6% were aged 15-19, 19.5% were in the 20-24 age range, 55.2% fell within the 25-29 age group, 10.7% were in the 30-34 age bracket, and 28.6% were above 35 years old. This breakdown offers a comprehensive view of the age distribution within the respondent population, which is crucial for the study's accuracy and relevance.

The survey provided insightful information on the sponsors of the students to determine their level of dependency and independence. It was found that 20.4% of the respondents sponsored themselves, 46.6% were sponsored by their parents, 25.1% by other family members, and 8% by non-family sponsors. Regarding the current level of study, 32.5% were in Year 1-2, 64% in Year 3-4, 2.9% in Year 5-6, and 0.6% were spending an extra year. Gender analysis showed 34.8% male and 65.2% female respondents. In terms of religion, 87.6% were Christians, 9.2% Muslims, 2.7% African Traditional Worshippers, and 0.6% affiliated with other religions. Concerning monthly income, 9.2% received less than 10,000 Naira, 23.5% were partially independent, 73.2% received 10,000-20,000 Naira, and 14.4% received 21,000-30,000 Naira.

That's a detailed breakdown of the preferred browsers and gadgets used by the undergraduate population! It's interesting to see that Google Chrome is the top choice among the respondents, with 70.1% using it as their regular browser. Mozilla Firefox and Opera Mini follow with 8.8% preference each. Internet Explorer and Phoenix also have their user base at 5.6% and 8.6%, respectively.

Regarding the types of gadgets used for internet access, it's quite diverse. Android phones are the most popular at 58.4%, followed by laptops at 20.4%. iPhones are used by 13.9% of the respondents, while Android tablets and desktop computers are used by 4.1% and 3.2%, respectively. It's fascinating to see how technology preferences vary among the undergraduate population!

Table 1: Distribution of respondents by socio-demographic variables

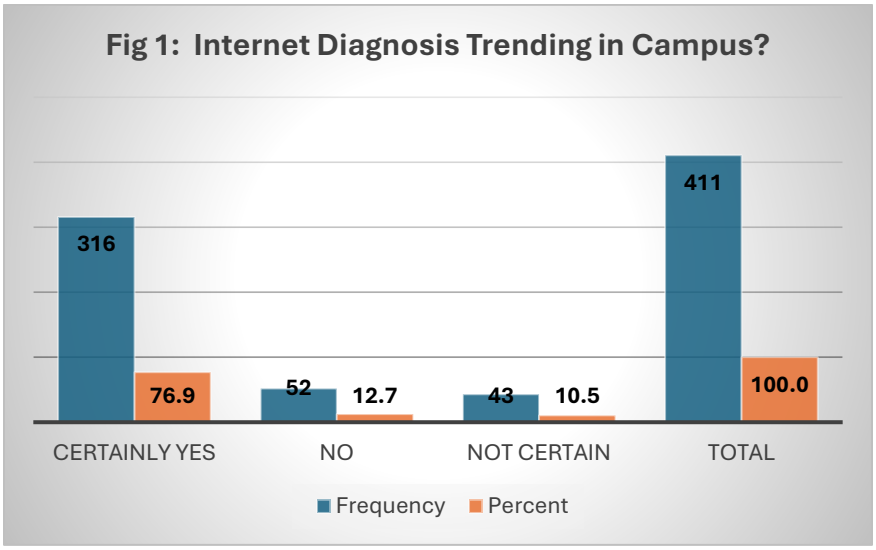
Demographic variables	**Frequency (n=370)**	**Percentage (%)**
Age		
15-19	60	14.6
20-24	80	19.5
25-29	227	55.2
30-34	44	10.7
35 and Above	106	28.6
Respondent's Gender		
Male	143	34.8
Female	268	65.2
Respondent's Current Level of Study		
Year 1-2	123	29.9
Year 3-4	227	55.2
Year 5-6	54	13.1
Extra Year	7	1.7
Respondents' Preferred Internet Browser		
Google Chrome	288	70.1
Fire Fox Mozilar	36	8.8
Internet Explorer	23	5.6
Opera mini	36	8.8
Phoenix	28	6.8
Respondents' Sponsors		
Self	84	20,4
Parent	191	46.5
Other Relations	103	25.1
Non family members	33	8.0
Respondents' Religious Affiliation		
Christianity	360	87.6
Islam	38	9.2
Others	11	2.7
Average Allowance per month		
<N10, 000	38	9.2
N10,000 – N20, 000	301	73.2

N21,000 – N30,000	59	14.4
N31, 000 and Above	31	3.2
Phone Type		
Andriod	240	58.4
IPhone	57	13.9
LAPTOP	58	20.4
Android Tablet	17	4.1
Desktop system.	13	3.2

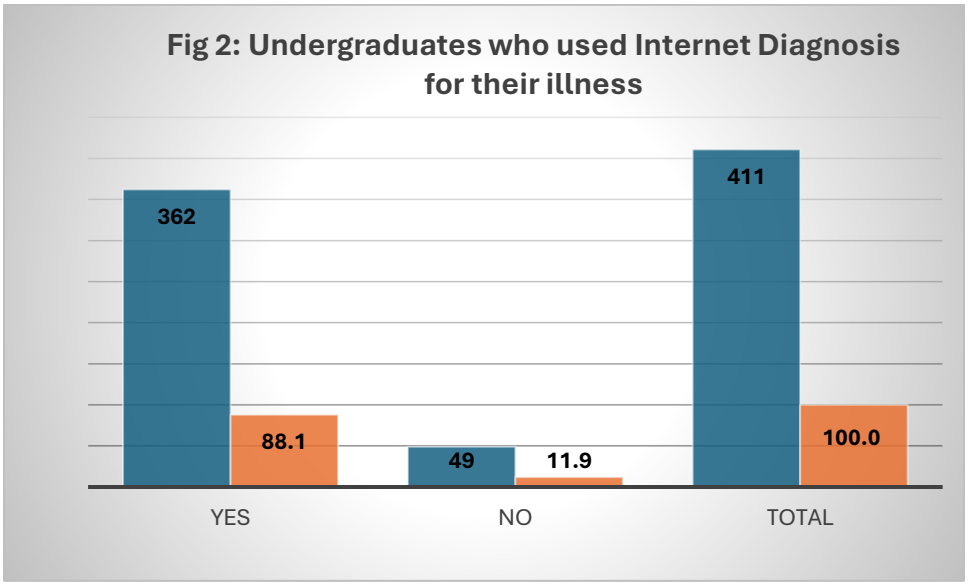
Internet Diagnosis

The analysis on internet diagnosis focuses on five key questions or variables related to the practice and prevalence of internet diagnosis among the undergraduate population. These questions aim to understand if the students have used internet diagnosis for any illness, how frequently they use it, how they learned about internet diagnosis, and whether they have recommended any online symptom checker to others. By exploring these variables, the study can gain insights into the students' behaviors and attitudes towards using the internet for medical information and diagnosis. It's crucial to understand the impact of internet diagnosis on healthcare practices and decision-making among the surveyed undergraduates.

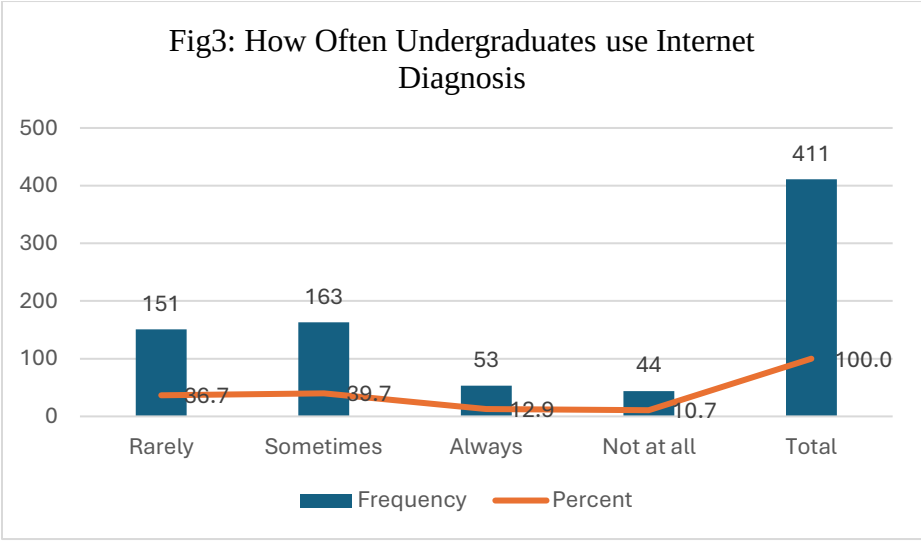
Concerning the assessment of whether internet diagnosis is trending among undergraduates at Niger Delta University, the survey depicted in Fig 1 revealed that 316 (76.9%) of the population affirmed that they are certain that internet diagnosis is trending in the university. Additionally, 52 (12.7%) of them stated that internet diagnosis is not trending on their campus, while 43 (10.5%) of the population indicated that they are not entirely sure if internet diagnosis is trending among undergraduates in the study area. Based on the aforementioned results, it is evident that internet diagnosis is trending among undergraduates in the study area. This conclusion is drawn from the fact that those who indicated they are certain that internet diagnosis is trending outnumber those who are unsure or unaware of its trend.



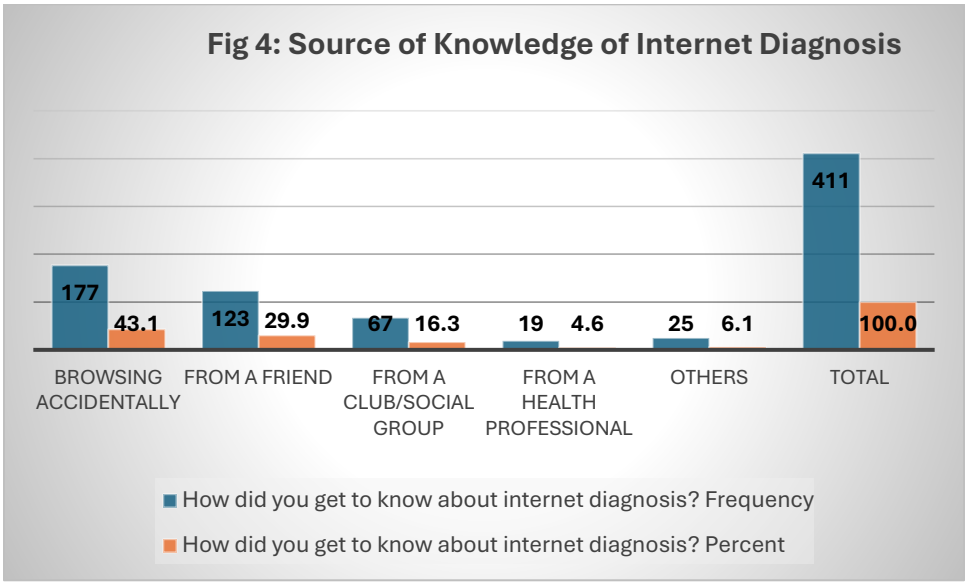
Secondly, the analysis on internet diagnosis aims to determine if undergraduates have utilized it for their illnesses. The survey results, as displayed in fig 2 below, revealed that 362 (88.1%) of undergraduates indicated that they have used internet diagnosis for their illnesses. On the other hand, 49 (11.9%) of them mentioned that they have not used internet diagnosis for any of their illnesses. Clearly, more than half of the population stated that they have utilized internet diagnosis for their illnesses. This outcome aligns with the survey indicating the prevalence of internet diagnosis among undergraduates.



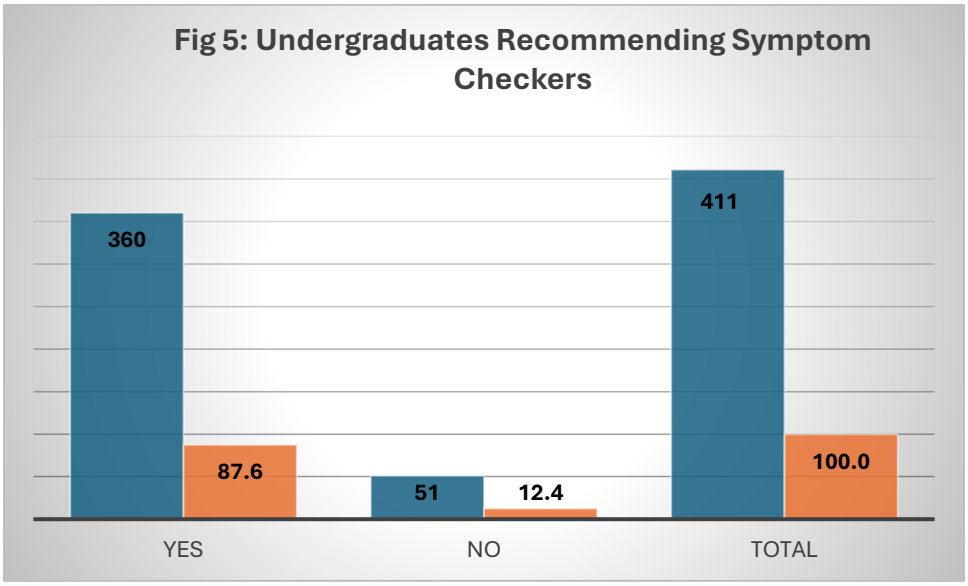
Thirdly, another variable used to measure internet diagnosis is the question determining how often undergraduates use internet diagnosis for their illnesses or symptoms. Once again, the results from the survey, as displayed in fig 3 below, indicated that 151 (36.7%) of undergraduates rarely use internet diagnosis. Additionally, 163 (39.7%) of undergraduates sometimes use internet diagnosis, while 53 (12.9%) of them always use internet diagnosis for their illnesses or perceived symptoms. Furthermore, 44 (10.7%) of them indicated that they do not use internet diagnosis at all for any of their illnesses or symptoms. Consequently, the survey affirmed that the majority of undergraduates make use of internet diagnosis in one way or another.



Furthermore, the analysis of internet diagnosis is gauged by how undergraduates acquire their knowledge of internet diagnosis, specifically their sources of information. The survey results, depicted in Fig. 4 below, unveiled various sources from which undergraduates gained their understanding of internet diagnosis. It was revealed that 177 (43.1%) of undergraduates became familiar with internet diagnosis through browsing and stumbling upon online diagnostic sites accidentally. Similarly, 123 (29.9%) of them obtained their knowledge from a friend, while 67 (16.3%) acquired their knowledge of internet diagnosis from their clubs or social groups. Additionally, 19 (4.6%) of undergraduates received their knowledge of internet diagnosis from a health professional, whereas 25 (6.1%) indicated that their knowledge of internet diagnosis is obtained from other sources.



Finally, the analysis of internet diagnosis also investigates the tendency of undergraduates to recommend symptom checkers to others. The results, illustrated in Figure 5, demonstrated that 360 (87.6%) of undergraduates stated that they have recommended online symptom checkers to others, particularly their course mates, while 51 (12.4%) of them mentioned that they do not recommend online symptom checkers to anyone.

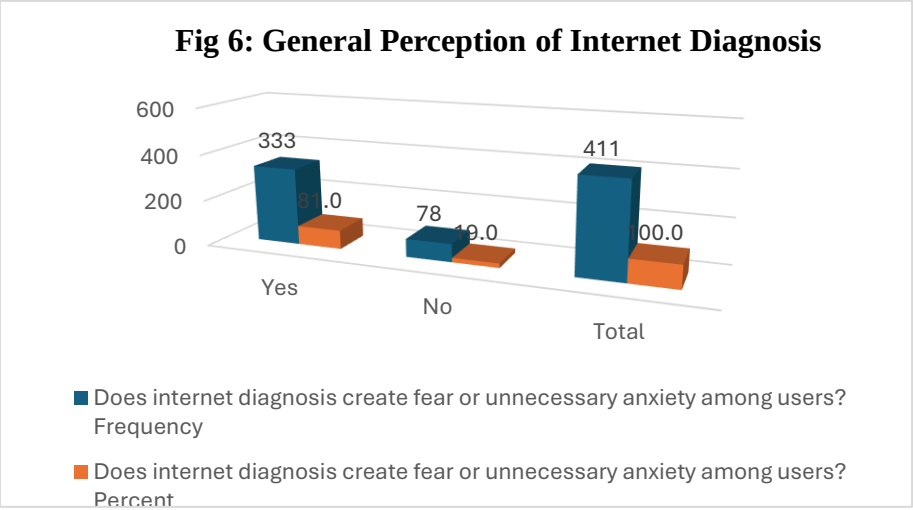


Undergraduates' Perception of Internet Diagnosis

The analysis of undergraduates' perception of internet diagnosis is gathered through five specific questions (variables) that explore the general and specific viewpoints of internet diagnosis among undergraduates in the study area. These questions aim to empirically determine whether the general perception of undergraduates towards internet diagnosis is positive or negative. Additionally, they seek to ascertain if internet diagnosis is considered a good alternative to conventional healthcare systems. Furthermore, the survey investigates the views of undergraduates regarding the accuracy of internet diagnosis.

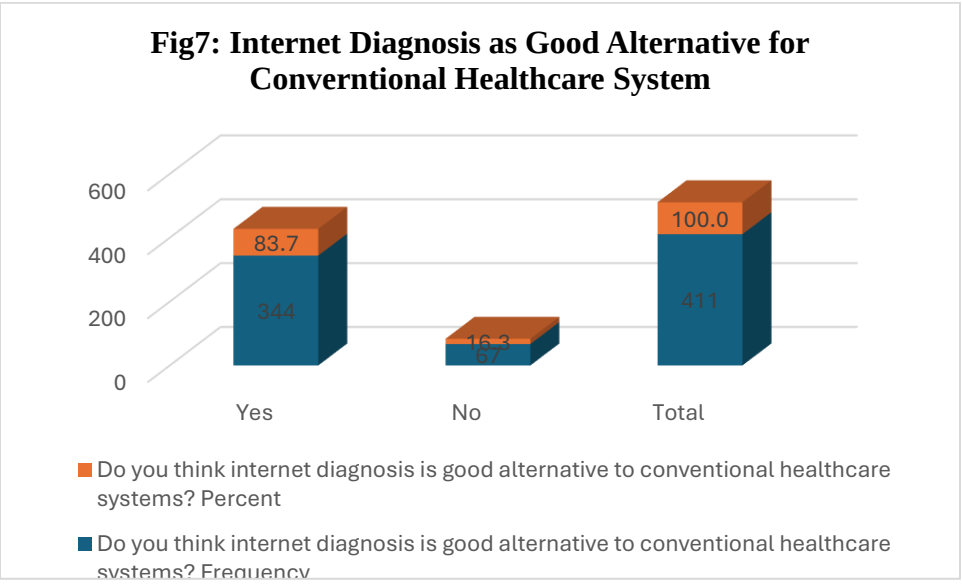
The survey on the perceptions of undergraduates effectively determined the general viewpoint of undergraduates regarding whether internet diagnosis is perceived as positive or negative. The survey results, as depicted in Figure 6, revealed that 349 (88.9%) of the population affirmed that the use of internet diagnosis and its outcomes are positive, while 62 (15.1%) of the population expressed the view that internet diagnosis is negative.

Fig 6: General Perception of Internet Diagnosis



Furthermore, the survey results depicted in Figure 7 illustrated that 344 (83.7%) of undergraduates stated that internet diagnosis is considered a good alternative to the conventional healthcare system, while 67 (16.3%) disagreed with this view. This survey specifically confirmed that the majority of undergraduates support the use of internet diagnosis as a viable alternative to the traditional healthcare system.

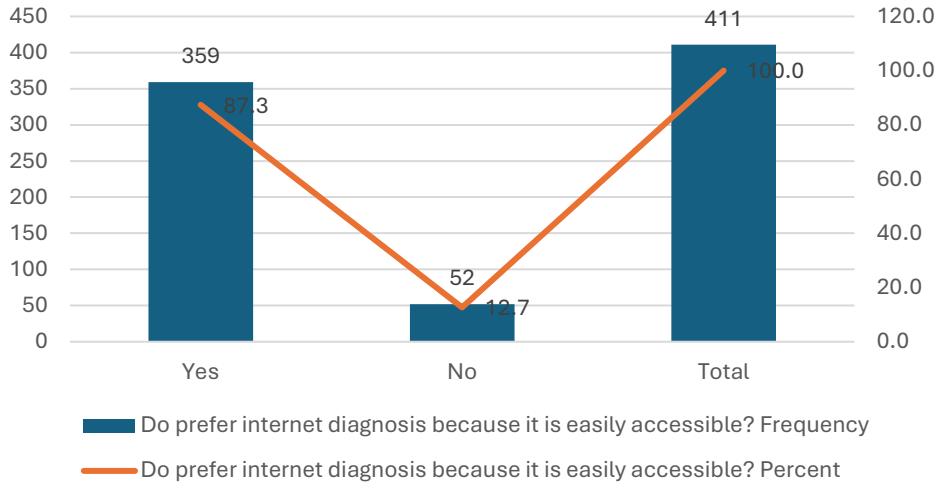
Fig7: Internet Diagnosis as Good Alternative for Converntional Healthcare System



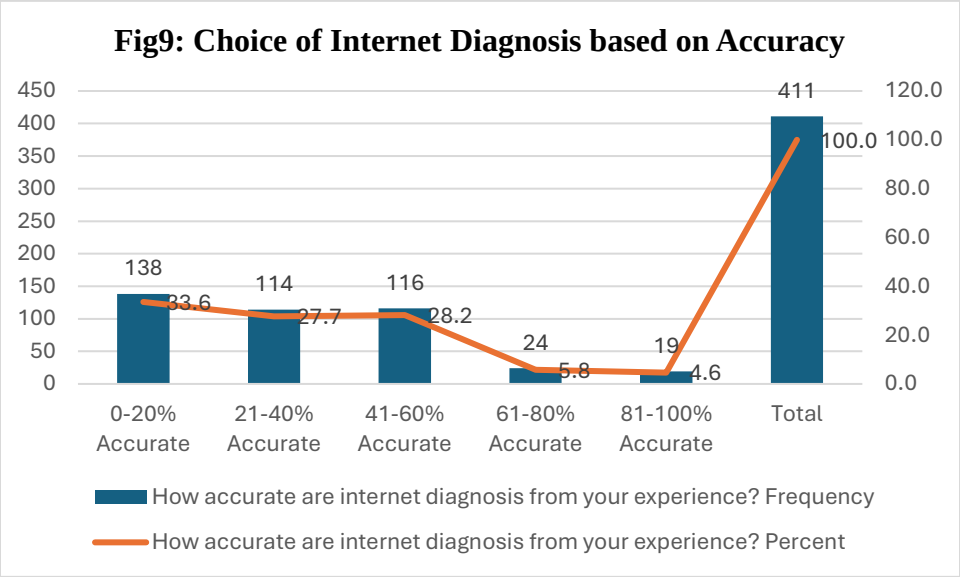
Additionally, the survey results presented in Figure 8 outlined the undergraduates' perception of internet diagnosis. It clearly indicated that 359 (87.3%) of the population affirmed that their

preference for internet diagnosis is based on easy access, while 52 (12.75%) of the population disagreed by stating that easy access to the internet does not influence their preference for internet diagnosis. From this data, we can infer that the majority of undergraduates prefer internet diagnosis due to its easy accessibility.

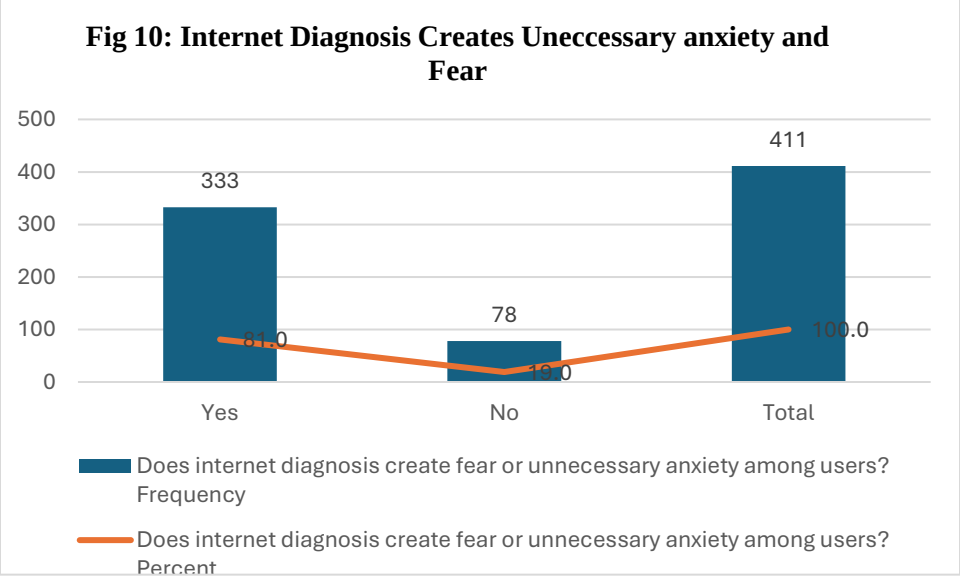
Fig 8: Preference of Internet Diagnosis due to Easy Access



The survey results in Figure 9 provided insight into the undergraduates' perception of the accuracy of internet diagnosis. The data indicated that 138 (33.6%) of undergraduates believed internet diagnosis to be 0-20% accurate, 114 (27.75%) perceived it as 21-40% accurate, and 116 (28.2%) stated it to be 41-60% accurate. Additionally, 24 (5.8%) of respondents considered internet diagnosis to be 61-80% accurate, while 19 (4.6%) believed it to be 81-100% accurate. This analysis clearly shows a varied perception among undergraduates regarding the accuracy of internet diagnosis.

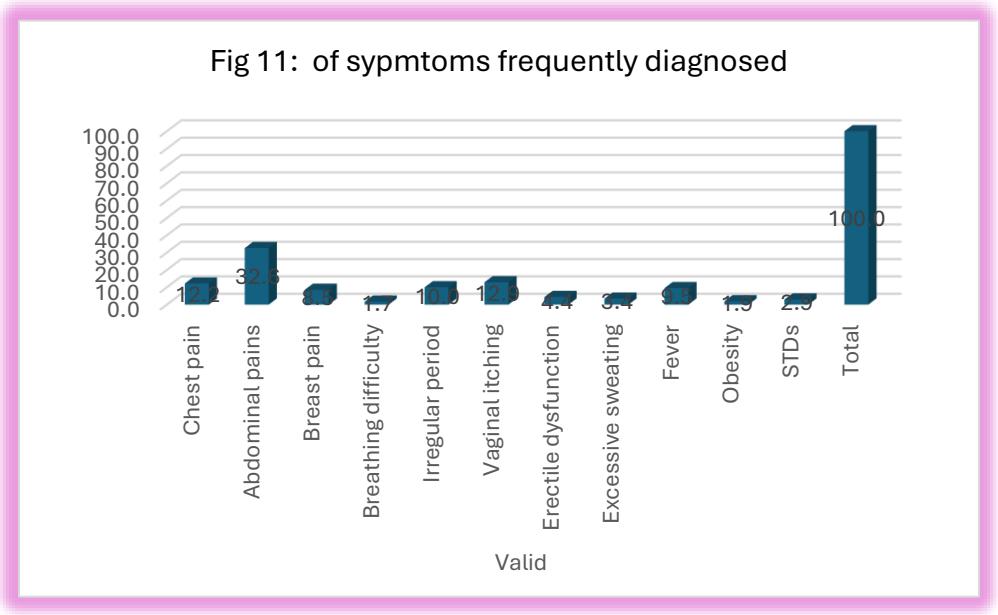


Wrapping up the analysis of undergraduates' perception of internet diagnosis, the survey results depicted in fig 10 revealed that 333 (81.0%) of the population stated that internet diagnosis does not induce anxiety or fear, while 78 (19.0%) acknowledged that internet diagnosis does create some form of anxiety and fear. This finding suggests that despite the increasing popularity of internet diagnosis, there are recognized risks associated with it.



Types of Symptoms Frequently Diagnosed Online

The data presented in the chart highlights the various types of symptoms commonly diagnosed by undergraduates. It indicates that a portion of the population frequently seeks internet consultation for specific symptoms. For instance, 12.2% of individuals often turn to the internet for diagnosing chest pain, 32.6% for abdominal pains, 8.5% for breast pain, 1.7% for difficulty in breathing, 10.0% for irregular periods, 12.9% for vaginal itching, 4.4% for sore throat and obesity, and 3.4% for excessive sweating. Moreover, the survey revealed that 9.5% of the population frequently seeks internet diagnosis. Additionally, 1.9% is diagnosed with obesity, while 2.9% of the population frequently receive diagnoses of Sexually Transmitted Diseases (STDs).



Positive Impacts of Internet Diagnosis

The analysis of the results obtained from Research question 4, which focuses on the positive impacts of internet diagnosis among undergraduates at Niger Delta University, as presented in Table 8, showcases the findings and insights derived from the field. Based on the analysis of the survey results regarding the positive impacts of internet diagnosis among undergraduates at Niger Delta University using the Likert 5-point scale measurement, here are the findings:

1. For the first variable concerning undergraduates gaining a better understanding of their symptoms through online symptom checkers, the total mean response was x>4 with a standard deviation of 2. This suggests that students highly agreed that they improved their symptom understanding through online resources.

2. Regarding the second variable on whether internet diagnosis increases access to a variety of medications, the total mean response was x<3.8 with a standard deviation of 1.9. This indicates that students did not strongly agree that internet diagnosis significantly increased access to a variety of medications.

3. The third variable focused on whether internet diagnosis reduces the burden on conventional healthcare systems. The total mean response was x<3.5 with a standard deviation of 1.8, suggesting that students were neutral or slightly disagreed with the idea that internet diagnosis alleviates the burden on healthcare systems.

4. The fourth variable examined the influence of religious beliefs on undergraduates' use of self-medication. The total mean score was x<3.4, indicating that students were somewhat neutral or disagreed with the notion that religious beliefs increased self-medication practices.

5. Lastly, the fifth variable assessed whether undergraduates had their health problems resolved through internet diagnosis on more than two occasions. The total mean response was x>3.8 with a standard deviation of 1.9, suggesting that students generally agreed that internet diagnosis helped solve their health issues multiple times.

Based on the statistical analysis provided, it is evident that all the variables related to internet diagnosis and its positive impacts among undergraduates at Niger Delta University have robust mean values that surpass the critical mean value of x=3. This indicates that all the variables are indeed significant factors contributing to the positive impacts of internet diagnosis among students at the university.

Table 2: Positive impact of Internet diagnosis

VARIABLES	RESPONSES	FREQUENCIES	MEAN (X)	STANDARD DEVIATION	RESEARCH DECISION
I get better understanding of my symptoms through online symptoms checkers	Strongly Agree Agree Undecided Disagree Strongly Disagree	48 340 - 23 - 411	4	2	Accepted
Internet diagnosis Increase access to varieties of medication	Strongly Agree Agree Undecided Disagree	5 383 4 16 3 411	3.8	1.9	Accepted

	Strongly Disagree				
Internet diagnosis reduces the burden on the conventional healthcare systems	Strongly Agree Agree Undecided Disagree Strongly Disagree	69 252 8 12 70 311	3.5	1.8	Accepted
I have gotten my health problems solved through internet diagnosis at least in more than two occasions	Strongly Agree Agree Undecided Disagree Strongly Disagree	66 377 4 44 20 411	3.8	1.9	Accepted

Dangers of Internet Diagnosis

From the analysis of the results obtained regarding the dangers or direct negative consequences of the use of internet diagnosis and self-medication among undergraduates at Niger Delta University. Based on the detailed analysis provided regarding the dangers of using internet diagnosis among undergraduates at Niger Delta University, it is evident that several significant risks have been identified. Let's break down the findings based on the data presented in Table 9:

1. Risk of Drug Abuse and Drug Dependence:
   - Total Mean Response: $x<4$, SD=2
   - This indicates that undergraduates are at risk of potential drug abuse and dependence as a result of utilizing internet diagnosis tools.

2. Risk of Health Complications:
   - Total Mean Response: $x<3.1$, SD=1.6
   - The data suggests that there is a concern for the possibility of health complications arising from the reliance on internet diagnosis among students.
3. Risk of Lifetime Health Disorders:
   - Total Mean Score: $x<2.6$, SD=1.3
   - This finding highlights the potential long-term health consequences that undergraduates may face due to engaging in self-medication based on internet information.

4. Risk of Financial Wastage:
- Total Mean Response: x>3.3, SD=1.7
- The results indicate a significant risk of financial wastage associated with internet diagnosis practices among students.

5. Risk of Loss of Life: - Total Mean Response: x>2.3, SD=1.2

Table 3: Dangers of Internet Diagnosis

ITEMS	RESPONSES	FREQUENCIES	MEAN (X)	STANDARD DEVIATION	RESEARCH DECISION
Risk of drug abuse and drug dependence	Strongly Agree Agree Undecided Disagree Strongly Disagree	210 92 69 40 - 411	4	2	Accepted
Risk of health complication	Strongly Agree Agree Undecided Disagree Strongly Disagree	45 254 10 100 2 411	3.1	1.6	Accepted
Risk of Life time health disorder	Strongly Agree Agree Undecided Disagree Strongly Disagree	20 37 2 260 92 411	2.6	1.3	Rejected
Risk of financial wastage	Strongly Agree Agree Undecided Disagree Strongly Disagree	23 40 7 250 91 411	3.3	1.7	Accepted
Risk of loss of life	Strongly Agree Agree Undecided Disagree Strongly Disagree	23 40 7 250 91 411	2.3	1.2	Rejected

The data suggests that there is a potential danger of loss of life linked to the use of internet diagnosis and self-medication among undergraduates. These findings underscore the importance of understanding and addressing the potential negative consequences and risks associated with relying solely on internet diagnosis and self-medication, emphasizing the need for caution and proper healthcare guidance among students at Niger Delta University.

After carefully examining the analysis provided, it is clear that most dangers of internet diagnosis, except for the third and fifth ones, showed strong mean values, confirming their significant impact on the risks associated with internet diagnosis. However, the risks related to complicated health and loss of life (third and fifth dangers) were completely dismissed as factors influencing the dangers of internet diagnosis among undergraduates at Niger Delta University due to their weak mean scores obtained from the population.

Discussion of Findings

In light of the analyses above, it is evident that the survey results empirically confirmed how all the variables relate to the main research questions. However, it is crucial to discuss these findings to provide a clearer view of the results and how they connect with previous research findings.

The study on undergraduates' perceptions of internet diagnosis and self-medication revealed various viewpoints that directly align with the research questions. Firstly, the study confirmed how convenient, easily accessible, and affordable internet diagnosis is for undergraduates. Another perception highlighted how internet diagnosis ensures privacy, confidentiality, and helps prevent stigmatization among the population. Additionally, the majority of the population believe that internet diagnosis is safe only when used accurately. Interestingly, the study found that internet diagnosis does not lead to any health complications. Surprisingly, the study further confirmed that most online symptom checkers are highly accurate and reliable. All these perceptions strongly support why internet diagnosis is prevalent among the younger generation. These findings are consistent with the research by Obasola et al. (2016) on people's perceptions of internet diagnosis. Their study showed that the majority of respondents who perceived available health information as accurate and reliable also had the opportunity to seek similar information about their health conditions from various online sources. They concluded that this influenced their perception of the accessed information. Additionally, they affirmed that there was no significant difference between male and female respondents regarding the perceived accuracy and dependability of online health information sought

The study on how socio-demographic factors determine the use of internet diagnosis revealed interesting findings. It was affirmed that undergraduates who are completely dependent on their parents are less likely to use internet diagnosis compared to those who are partially or fully independent. This is because parents often take responsibility for their child's healthcare while in university. Similarly, the study found that undergraduates above 20 years of age are more likely to engage in internet diagnosis and self-medication than those below 20. Older students are more familiar with using internet diagnosis for self-medication purposes. Additionally, the study showed that students with lower income tend to be more involved in internet diagnosis than those with

higher income, mainly due to financial constraints. Further findings on the impact of socio-demographic factors on internet diagnosis use indicated that religious beliefs influence self-medication, particularly among Christians who make up the majority of the population. Lastly, the study noted that there is no difference between non-medical students and medical students in terms of internet diagnosis use. These findings align with Misati's (2012) research, which highlighted how socio-demographic status affects self-medication. Misati specifically found that the most common age group for self-medication was 25-29 years old, with 25.9% engaging in self-medication, while the lowest usage of antibiotics was among those below 20 years old at 3.5%. Factors such as being single, belonging to the 25-29 age group, having a primary or lower educational status, having a chronic illness, perceiving health negatively, and having low income increased the likelihood of self-administering antibiotics.

The study on symptoms frequently diagnosed through online symptom checkers highlighted that undergraduates show variations in the symptoms they choose. This variation is influenced by the current health challenges faced by undergraduates. Among the array of symptoms listed, including chest pains, abdominal pains, breast pains, breathing difficulties, sore throats, irregular periods, vaginal itching, erectile dysfunction, excessive sweating, fever, and sexually transmitted diseases, the symptoms with the highest percentages are chest pain (38.9%), fever (17.7%), and irregular periods (10.9%). These findings indicate that undergraduates commonly seek online diagnosis for symptoms related to chest pain, fever, and irregular periods.

The study on the positive impact of internet diagnosis among undergraduates revealed some interesting findings. The majority of the surveyed undergraduates confirmed that they gained a better understanding of their symptoms through online symptom checkers. Additionally, the study highlighted that internet diagnosis exposes them to a wider range of medications that might be more expensive through traditional healthcare systems. Moreover, the research indicated that internet diagnosis helps reduce the burden on conventional healthcare systems.

Furthermore, the study found that a majority of the surveyed undergraduates reported successfully resolving health issues through internet diagnosis on multiple occasions. These results align with a study by Ghahramani et al. (2020), which demonstrated that seeking health information online can enhance individuals' health knowledge and improve their quality of life.

The study on the dangers of internet diagnosis highlighted some significant risks despite the benefits it offers. Surprisingly, the research revealed that undergraduates are at risk of drug abuse and dependence due to internet diagnosis. Another alarming finding is that undergraduates may experience health complications from incorrect application of online diagnosis.

When questioned about the risks of lifelong health disorders and loss of life associated with internet diagnosis, the majority of the population denied these concerns. However, the findings of Alamgir et al. (2018) contradicted this belief. Alamgir et al. (2018) concluded in their study that self-medication resulting from internet diagnosis can lead to various health complications such as improper self-diagnosis, delays in seeking medical advice, insomnia, depression, abdominal discomfort, weakened immune system, kidney failure, and liver cirrhosis.

Given the increasing trend of internet diagnosis among undergraduates, it's evident that the internet has become a widely used tool for seeking information in various areas of life. The healthcare sector, in particular, has experienced a significant impact from the proliferation of online platforms providing medical information, such as websites, forums, and applications. A contentious issue arising from this trend is internet diagnosis, where individuals try to diagnose their health issues using online resources.

Internet diagnosis has numerous benefits for individuals seeking health information. It offers quick and convenient access to a wealth of medical information, enabling users to research symptoms, conditions, and treatments from the comfort of their homes. This is particularly helpful for those who may lack the time or means to visit a healthcare professional in person. Moreover, internet diagnosis empowers undergraduates to take charge of their health, enabling them to make informed decisions about their care, fostering autonomy and active participation in healthcare. Online resources also serve as valuable educational tools, enhancing undergraduates' understanding of their health and aiding in the recognition of potential warning signs for serious conditions. Platforms with symptom checkers or diagnostic tools can guide users on when to seek medical assistance and what questions to pose to their healthcare provider. Overall, internet diagnosis plays a crucial role in early detection and intervention, potentially enhancing health outcomes and alleviating the strain on the healthcare system.

The study has revealed that despite the potential benefits of internet diagnosis, significant dangers are associated with it. One major concern is the accuracy and reliability of online medical information. The internet is full of websites, forums, and blogs that may contain outdated, misleading, or even harmful content, leading to incorrect self-diagnoses and inappropriate treatment choices. This can have severe consequences for individuals' health, as delays or mismanagement of treatment can worsen conditions and result in unnecessary complications. Additionally, the study highlights that internet diagnosis can trigger anxiety and hypochondria in users, as they might misinterpret common symptoms or misdiagnose themselves with rare or serious conditions. This phenomenon, known as cyberchondria, can cause unnecessary stress, excessive medical visits, and ultimately waste resources for both individuals and healthcare providers. Furthermore, relying on internet diagnosis may undermine the expertise and authority of trained healthcare professionals, potentially diminishing trust in the medical system and leading to a lack of accountability in the decision-making process.

Conclusion

The study concluded that there are variations in the health challenges faced by undergraduates, which influence the types of internet diagnosis they utilize. The study also concluded that socio-demographic factors determine the prevalence of internet diagnosis among undergraduates. In this context, the study further found that students who are completely dependent on their parents are less likely to engage in internet diagnosis compared to students who are partially or completely independent from their parents. Similarly, students with lower or average incomes seem to be more involved in internet diagnosis.

Thirdly, the study concluded that there are positive impacts of using internet diagnosis, contrary to the views of previous scholars. The study found that internet diagnosis is convenient, accessible, and cost-effective. It also offers broad access to a variety of affordable diagnoses and medications. However, the study also highlighted the risks and dangers associated with internet diagnosis, including the risk of drug abuse and dependence, health complications, lifelong health disorders, financial wastage, and even loss of life, though rare.

Recommendations

To address the social factors associated with internet diagnosis among undergraduates, the following recommendations are proposed:

Firstly, awareness campaigns should be intensified to educate young adults on the risks of internet diagnosis while promoting a balanced approach between conventional healthcare and online medical resources. The government, healthcare providers, and educational institutions should leverage their platforms for this enlightenment.

Secondly, strict government regulations should be enforced to curb self-medication, ensuring legal actions against those promoting or engaging in unsafe medical practices. Additionally, the government should improve healthcare accessibility by providing well-equipped, affordable, and functional medical facilities to reduce reliance on internet diagnosis.

Culturally, fostering a responsible information-seeking attitude and critical thinking among young adults is crucial. This can enhance informed healthcare decisions and optimize the benefits of digital medical resources.

Finally, collaborative efforts between the government, families, and higher institutions are necessary for monitoring the health of young adults. Regular health assessments for students and family-level healthcare supervision, including having a family doctor, should be encouraged to ensure better health outcomes.

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