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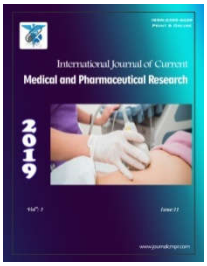

Research Article

HYPOCHONDRIASIS AND ITS ASSOCIATION WITH INTERNET USE AMONG MEDICAL STUDENTS

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ABSTRACT

Introduction: Medical education and career is the most physically and mentally demanding career, with obvious stressors such as long clinical hours, extensive study and arduous assessments. Amongst these, hypochondrial concerns are a major overlooked factor. Addressed as "Medical students' disease" (MSD), nosophobia and others, it has been proved, and disproved as a stressor by various researches. Moreover, with the availability of extensive information on the Internet, validating such concerns is more easier now than ever, also giving birth to the concept of 'Cyberchondria'. This study aims to dig deeper into learning about such hypochondrial concerns amongst medical students, and find out the role of Internet use as a cause of such concerns and existence of cyberchondria in medical students.

Methods: This is a cross sectional study, comprising self-administered questionnaires distributed among undergraduate medical students of first to fifth year. Questionnaire included demographic details, general information regarding internet use, and Whiteley's index to assess hypochondrial concerns.

Results: A total of 384 responses were analyzed, with 75.6% females and 24.4% males. 64.8% of participants admitted their lives to be affected by internet use, with 55% using the internet to look up their symptoms. 66.1% participants were not satisfied with their overall health, with more than two-thirds (70.9%) admitting being mentally affected by unexplained aches and pains in their body. Whiteley scores revealed a mean score of 29.76, with 40.1% population scoring above the cut-off value of 33, indicating significant hypochondrial concerns, with around two thirds being females.

Conclusion: A relatively large population was found to have hypochondrial concerns and association with internet use was found, indicating the need to address the issue by organizing counselling session for students to alleviate their concerns. Through knowledge that such concerns are a part of learning process, students can be taught techniques to help cope with their worries and anxiety towards their health.

INTRODUCTION

The profession of medicine has been considered an extremely challenging and daunting career for a long time, consisting of extensively intricate knowledge, continuous multiple examinations, arduous schedules of classes and, in senior years, hectic clinical postings as well. Ultimately, this vast array of knowledge has its effects on the individuals associated with this field, particularly medical students. Numerous studies conducted over the world have concluded that medical students have a substantially higher proportion of prevalence of stress, depression, anxiety, burnout, suicidal ideations, mental disorders and addictions [1-2]. Obvious reasons for such alarming prevalence rates include academic, environmental and psychological stressors that have been extensively studied and concluded as stressors [3]. Amongst the stressors, one that is less studied and often overlooked as superstitious, exaggerated or even comical is the hypochondriac concern that resides among medical students. The condition that is characterized by these hypochondriac concerns amongst medical students has been addressed in literature by different terms, including health anxiety, Medical Students Disease (MSD), medical student syndrome and nosophobia [4]. This health anxiety may range from intermittent worry to a pathological preoccupation of contracting the disease which falls under the criteria for hypochondriasis [5]. This terminology has been around for a long time. For instance, in a study conducted by Hunter, Lohrenz, and Schwartzman, almost three-fourth of the students

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suffered from health anxiety. Similar results were found in later studies [6-7]. However, in another study done by Hrvoje, Barić, and Vladimir Trkulj, such relations were contradicted and concluded that relation of health anxiety to medical education was more concerned with lower levels of perception of symptoms as being dangerous or a source of worry [8]. A possible reason for such contradictory results might be due to the methodology adopted, age, gender or even the time of academic year when the study was conducted.

More recently, according to a study by Moss Morrie and Petrie, hypochondrial concerns amongst medical students is an established phenomenon, with two components; a Perceptual component (giving rise to the thoughts/suspicion that the student has the illness or symptoms they are currently studying) and an Emotional component (giving rise to anxiety and concerns due to the Perceptual component [9]. Moss Morrie and Petrie proposed that the Perceptual component was maintained throughout the years of study, which could be explained by the constant barricade of knowledge acquired each year. While the Emotional component seemed to follow a declining slope throughout the years, which, in our opinion, could be explained by the maturity that comes naturally as one ages (both physically and emotionally) as well as being equipped with the clinical knowledge of treating and tackling the disorders already studied.

Among the means to gain information to address their health anxiety, the internet has emerged as a major source, with its easy accessibility, privacy, cost, and information. According to a study in Lahore, more than 50% of students used the internet for some form of health-related information [10]. This has given rise to a new term in culture, called 'Cyberchondria'. Defined as 'An undefined fear or distress related to minor symptoms associated with information gained from the Internet' [11], it can be considered a form of hypochondriasis particularly related to Internet use. Despite an extensive literature search, no such study addressing the general hypochondrial health concerns, and particularly whether cyberchondria exists in local setup has been conducted in Pakistan. One study conducted in AKU, Karachi studied this phenomenon and found health concerns to be associated with addictions [12].

Therefore, due to lack of sufficient studies and poor mental health particularly among Pakistani medical students, no studies address the growing issue of cyberchondria, neither a study that reveals these concerns to be real in this setup has taken place. Therefore, such studies are necessary to be done, to identify and reduce modifiable stress factors from this group.

The objective of this study is to check for health-related concerns and anxiety amongst the undergraduate medical students of a government medical institute in Karachi, Pakistan. Furthermore, we also intend to explore whether the phenomenon of cyberchondria exists in this setup or not.

METHODS AND MATERIALS

This is a cross-sectional study, conducted amongst medical students of a public sector medical college in Karachi for three months. A sample size of 384 undergraduate medical students was calculated by Open Epi software, keeping a confidence interval of 95%, absolute precision of 5% and a predicted prevalence of 50%. The questionnaire included participants ranging from ages 18 to 25 years (first year to fifth year) of medical school. Informed consent was taken, with no compulsion to participate in the research. The study included only MBBS and BDS students and students from other medical departments were excluded. Moreover, students suffering from any established diagnosed chronic disorder were also excluded. Students were approached by volunteers who were trained, and the questionnaire was in plain language with no difficult terminologies, hence, to be easily perceived.

The questionnaire was self-designed and included two sections. The first comprised of basic demographic information, and questions regarding trends and information concerning internet use. The second section comprised of the Whiteley Index (WI). However, the original dichotomous (True/False) version of the Whiteley scale was not employed. Instead, a Likert five- point scale version (from zero being the lowest score to four being highest) was used, as it has been proved to be more accurate through prior studies. A score above 33 will be labeled as at risk for hypochondriasis. According to the WI, each participant had to answer health related anxiety questions, (e.g.: Do you worry a lot about your health? If yes, do you search the symptoms on the internet and get anxious?) 14 items from the original WI and seven additional questions were asked, a total comprising of 21 items.

The data was entered using MS Excel and analyzed using the Statistical Package for Social
Sciences (SPSS) version 24.

RESULTS

A total of 430 questionnaires were distributed amongst students, with 398 questionnaires returned, giving a response rate of 92.5%. A summary of the first portion of the questionnaire related to basic information is summarized in table one:

Table 1 Demographic characteristics of participants

Variable	Frequency(n=398)	Percentage
Gender		
Male	97	24.4
Female	301	75.6
Institute		
DMC	386	97
OJHA	12	3
Age		
Below22	296	74.4
Above 22	102	25.6
Year of study		
1st	71	17.8
2nd	105	26.4
3rd	149	37.4
4th	44	11.1
5th	29	7.3

The majority of the participants in our study stated that their effect on life by internet use generally ranged from a moderate (34.9%) degree to quite a lot (29.9), together with half (48.7%) of the participants devoting quite a lot time on the internet.

Two-thirds of the participants either worried not at all (35.7%) or worried a little bit (30.9%) about their health, but almost half of the participants reported the thought that something was wrong with their body was moderate (25.1%) to quite a lot (23.1%).

A substantial portion of our sample stated that their difficulty in forgetting about themselves was not that severe (35.9% and 30.4%). Almost one third (33.4%) of the participants felt

annoyed when someone misinterpreted their sickness to wellness. A little more than half of the sample population (54.3%) found that they were not at all aware of things happening in their body.

Less than a third (29.1%) of the participants felt they were not at all bothered by aches and pains, whereas 36.7% felt that they were bothered a little bit. More than half (55.5%) stated that they had no fear of illness and were below a moderate level (63.1%) in worrying about their health more than most people.

A relatively smaller number of participants (18.1%) had a feeling above moderate level that people did not take their illness seriously, and only 3.0% had an extreme difficulty in believing the doctor that there is nothing to worry about with 2.0% always preferring a second opinion. A little less than half (47.2%) stated that they did worry about the possibility of a serious illness, but only 3.8% got extremely worried about getting one when brought into attention through media. More than two-thirds of participants either got not at all (36.2%) bothered or a little bit (36.4%) bothered by many different symptoms. However, only 14.3% had the symptoms of a very serious disease on an extreme level.

A little less than half of the participants (45.0%) did not search the internet for their symptoms. Only 8.0% were completely satisfied with their life, the majority (33.9%) feeling quite a lot satisfied by health. Only 2.8% compared their health with others and felt anxious over it.

The relationship of the four variables (gender, study year, health satisfaction and hours of internet use) with life affected by internet use were assessed using the Chi-square test and results are summarized in table three.

Table 3 Relations between internet use and variables

Characteristics	Not at all	A little	Moderate	Quite a lot	Extreme	Total	Chi-square p-value
Year of Study							0.089
1st	5 (7.0)	19 (26.8)	23 (32.4)	20 (28.2)	4 (5.6)	71 (17.8)	
2nd	11 (10.5)	1.7 (16.2)	38 (36.2)	23 (21.9)	16 (15.2)	105 (26.4)	
3rd	6 (4.0)	20 (13.4)	48 (32.2)	52 (35.0)	23 (15.4)	149 (37.4)	
4th	1 (2.3)	5 (11.4)	16 (36.4)	16 (36.3)	6 (13.6)	44 (11.1)	
5th	1 (3.4)	2 (6.9)	14 (48.3)	8 (27.6)	4 (13.8)	29 (7.3)	
Health Satisfaction							0.014
Not at all	0 (0.0)	5 (11.4)	12 (27.3)	16 (36.3)	11 (25.0)	44 (11.0)	
A little	4 (5.4)	9 (12.2)	26 (35.1)	24 (32.4)	11 (14.9)	74 (18.6)	
Moderate	2 (1.8)	14 (12.4)	44 (38.9)	38 (33.6)	15 (13.3)	113 (28.4)	
Quite a lot	13 (9.6)	30 (22.2)	45 (33.3)	35 (25.9)	12 (9.0)	135 (33.9)	
Extreme	5 (15.6)	5 (15.6)	12 (37.5)	6 (18.8)	4 (12.5)	32 (8.1)	
Gender							0.185
Female	15 (5.0)	49 (16.3)	109 (36.2)	84 (27.9)	44 (14.6)	301 (75.6)	
Male	9 (9.3)	14 (14.4)	30 (30.9)	35 (36.0)	9 (9.2)	97 (24.4)	
Hours on net							0.74
Between 1-2 hours	21 (7.2)	52 (17.8)	101 (34.6)	79 (27.0)	39 (13.4)	292 (73.4)	
Between 3-5 hours	2 (2.9)	8 (11.6)	27 (39.1)	24 (34.8)	8 (11.6)	69 (17.3)	
Between 6-9 hours	0 (0.0)	2 (6.7)	10 (33.3)	15 (50.0)	3 (10)	30 (7.5)	
More than 10 hours	1 (14.3)	1 (14.3)	1 (14.3)	1 (14.3))	3 (42.8)	7 (1.8)	

One-third of the participants (n=135, 33.9%) reported that they were quite a lot satisfied by their health, whereas the majority (n=45, 33.3%) amongst them advocated a moderate effect on life by internet use. The trend of majority lying in a moderate level effect on life was reported by all categories of health satisfaction except for those who had zero satisfaction. 36.3% (n=16) of the participants who were not at all satisfied by their health reported that the effect on their lives was quite a lot. This data is clinically significant, with a p-value of 0.014.

Equal percentages amongst females and males reported their effect on lives to be moderate (n=109, 36.2%) and quite a lot (n=35, 36.0%) respectively. This data was, however, not significant with a p-value of 0.185.

Three-quarters of the participants (n=292, 73.4%) spent between one to two hours on the internet, with 34.6% (n=101) reported that they had a moderate effect on lives. There were a handful of seven participants (1.8%) who spent more than 10 hours on the net with the majority (n=3, 42.8%) of them feeling an extreme effect on life. This data is not clinically significant, as confirmed by a p-value of 0.74.

Calculating the final scores of the Whitley scale revealed an average score of n=29.76 which is quite near to the pre-defined value of 33, above which risk for hypochondriasis is increased. Out of the total sample size, 40.1% (n=121) individuals had scores above the cut-off, with 28 males and 93 females. However, mean scores of both genders were almost equal. Frequency of responses on the Whiteley scale are summarized in table three:

Table 3 Internet use affecting other aspects of life

Internet use affecting other aspects of life	6.0%	15.8%	34.9%	29.9%	13.3%
Time usually spent on the internet	3.0%	6.8%	35.7%	48.7%	8.5%
Worrying about your health	35.7%	30.9%	18.8%	10.6%	4.0%
Thinking there is something seriously wrong with your body	12.1%	31.2%	25.1%	23.1%	8.5%
Difficulty in forgetting about yourself and instead thinking about all sorts of other things	11.3%	35.9%	30.4%	17.1%	5.3%
Becoming annoyed when someone tells you look better while you're ill	7.5%	26.9%	33.4%	25.1%	7.0%
Finding that you're often aware of various things happening in your body	54.3%	25.6%	11.6%	6.3%	2.3%
Being bothered by aches and pains	29.1%	36.7%	19.1%	11.1%	4.0%
Fear of illness	55.5%	25.9%	11.1%	5.0%	2.5%
Worrying about your health more than most people	28.4%	34.7%	22.1%	11.6%	3.3%
Getting the feeling that people are not taking your illnesses seriously enough	38.4%	27.6%	15.8%	13.3%	4.8%
Difficulty in believing the doctor when he/she tells you there is nothing for you to worry about	60.3%	21.1%	8.8%	6.8%	3.0%
Worrying about the possibility that you have a serious illness	47.2%	26.9%	12.3%	8.5%	5.0%
Worrying about getting a disease when it's brought into your attention (through the radio, TV, newspapers, or someone you know)	33.9%	27.1%	22.6%	12.6%	3.8%
Finding that you're bothered by many different symptoms	36.2%	36.4%	15.1%	9.5%	2.8%
Having the symptoms of a very serious disease often	17.6%	24.4%	20.1%	23.6%	14.3%
Thinking of having a disease after reading/learning about iy	39.2%	32.9%	15.6%	9.5%	2.8%
Searching the internet for your symptoms and getting anxious	45.0%	24.1%	16.6%	10.8%	3.5%
Preferring a second opinion, when finding it hard to believe the doctor	46.7%	22.9%	21.6%	6.8%	2.0%
Satisfaction with your health	11.1%	18.6%	28.4%	33.9%	8.0%
Worrying that no one can understand your health condition	45.0%	29.9%	12.6%	8.0%	4.5%
Comparing your health with others and/or feel anxious comparing it	36.9%	34.9%	16.3%	9.0%	2.8%
Belief that consuming a certain product will lead to worsening symptoms	24.6%	27.6%	25.6%	14.6%	7.5%

DISCUSSION

The primary outcomes of our study were related to the effects of internet use on the health of medical students. In this regard, hypochondriasis was a prespecified health target whose association with internet use was assessed. Our study demonstrates that almost half of the individuals spent quite a lot of time on the internet even though they agreed that internet use has generally influenced their lives adversely and not just their health. Similar results were obtained in a study conducted on medical students where students' sleep and academics were affected due to excessive internet use. The internet overuse in

medical students is partially unavoidable as they're bound to update their clinical knowledge; which is a field constantly growing and changing. However, this study also reports entertainment and communication a major source of these results for a good majority of students [13]. In another study on university students, high rates and greater consequences of internet overuse were seen. This study concluded that with internet addiction, students faced a hard time concentrating during their classes and have had their academics and extracurricular equally affected [14]. Hypochondriasis is a persistent abnormal anxiety about one's health [15]. Since it's a medical term that is known and understood by a few, symptoms of unnecessary psychological concerns and attitudes explaining health anxiety were instead evaluated. We found that medical students generally did not worry about their health a lot and even when media raised concerns about contracting a disease, they feared a little, if at all, about any possibility of having that illness. Also, students did not have a hard time believing in their doctor's satisfactory opinion about their health and abstained from getting a second opinion or surfing through the internet to further evaluate their health condition. Inconsistent results have been obtained from a previous study that reports concerns generally voiced by physicians on the effects of internet overuse on healthcare. Individuals tend to assume the internet to be a greater authority than trained doctors and prefer to self-diagnose and treat their condition based on the information they locate online instead of consulting a doctor [16].

The students in our study were satisfied and not anxious while comparing their health with that of others. However, a good number of students felt there was seriously something wrong with their bodies which they were not aware of and were irritated by people being inconsiderate about it. Assuming a minor symptom to be related to a serious disease and being extremely anxious about it is one of the greatest signs of hypochondriasis [17]. Our study also found that medical students are a little bothered by body aches and other symptoms because they often correlate these with the use of a certain product or a very serious disease. The latter could be the sole reason for hypochondriasis in medical students which, if well-developed, can result in medical students being more hypochondriac than others. Reportedly, people get more anxious and puzzled when they go through health-related information online 11. This is also explained in another study that defines hypochondriasis in medical students as "Medical Student Syndrome"; a form of health anxiety specifically regarding the diseases they study during their medical training. The study concluded significant overuse of health services among medical students affected by this syndrome compared with others [18]. In contrast to this, another cross-sectional survey conducted in London concluded no differences between medical students and others in hypochondriasis and health-seeking behaviors [19]. Statistically, significant results were obtained when individual health satisfaction was compared to the effects internet use has on one's life. Students with moderately affected lives had greater health satisfaction whereas those who had their lives significantly affected by internet use were not satisfied by their health at all. This strengthens the association between internet overuse and the development of hypochondriasis. The lower health satisfaction could be the result of health anxiety associated with the search for health-related information on the internet or Medical Student Syndrome described earlier. Alternatively, this could be due to internet-prompted self-diagnosis and treatment that can potentially result in ineffective and hazardous outcomes and thus, a lower health satisfaction [16]. Although males are highly addicted to the internet as compared to females [20], it could be speculated that they would experience side-effects of internet use more often as compared to their female counterparts. However, our study reported no significant difference between the effects of internet use on the lives of males and females. Similarly, an insignificant relationship of internet screen time with the effects on an individual's life was seen. A good majority of medial students spent only one to two hours on the internet and had their lives moderately affected by the internet. On the contrary, students who had a screen time exceeding 10 hours, a majority believed their lives were greatly affected by the internet. This might be due to the fact that students devote the time ideally meant for social and physical activities to internet use [21]. Thus, the greater the internet screen time, the unhealthier an individual's lifestyle is. In addition to this, students who spend more time on the internet reportedly suffer from loneliness and depression, whereas, internet use specifically to play video games was associated with aggressiveness [22]. Also, the risk of hypochondriasis is directly related to the amount of time spent on the internet 11 albeit, academics were seen to improve with increasing use of the internet [23].

Though our results conclude hypochondriasis in medical students based on questions assessing anxiety, a proper diagnosis rests on the Whiteley score of the population. Whiteley scale is a potential screening tool for hypochondriasis and aids in its diagnosis [24]. The cutoff for this scale is 33, above which the risk of hypochondriasis is significantly increased. Based on the responses of the students, an average Whiteley score calculated for the population was close to approaching the threshold. Almost half of the students had scores above the threshold which proves our conclusion on the students being hypochondriac solid and very reliable.

Our study is bound to have certain limitations. Due to convenience sampling, medical students from only two medical colleges of Karachi, Pakistan were specifically recruited to the study. Thus, this study doesn't give any idea about the true prevalence of hypochondriasis in undergraduate students of Karachi as students related to other fields could not be considered. Also, our results might also not be an accurate representation of the prevalence of hypochondriasis and its association with internet overuse among all medical students of Karachi, as the students were approached via convenience sampling and not random sampling and they belonged to a more or less similar social background and economic status. On the other hand, behavioral changes due to increased knowledge and awareness about logical reasons for hypochondriasis could not be assessed since a compare and contrast of medical and non-medical students on the basis of knowledge could not be done. Population distribution among the two genders was disproportionate i.e. more females than males and so a comparison of the effects of internet overuse on gender was not robust. Also, since females are better able to cope with anxiety and depression [25], the slight inconsistency in the responses to anxiety-related questions might solely be influenced by the majority of females in our study. This is, however, in contrast to data from the West where females had significantly more depression scores than males [26].

Since only medical students of Karachi, Pakistan were specifically recruited via convenience sampling, further researches with similar objectives should be done which should also include students from other medical colleges of Karachi and of Pakistan and also non-medical students. A comparison between medical and non-medical students on the basis of internet screen time and knowledge of hypochondriasis, its symptoms and management should always be drawn to assess if increased knowledge and awareness has an effect on its prevalence in the individuals. Random sampling should be preferred over convenience sampling in an effort to include students from different socioeconomic backgrounds. In addition, the population should be evenly distributed among the groups stratified from it for the comparisons to yield accurate qualitative results for each group. Following a complete assessment of the prevalence and severity of hypochondriasis and its association with internet use in Pakistan, a comparison can be accurately drawn between the East and the West. More people in the West use the internet as compared to the East [27] and the rates are further expected to rise in the upcoming years [28-29]. This could result in varied prevalence and severity of hypochondriasis in the two regions and so the association of hypochondriasis with internet overuse could be strengthened. Based on the results obtained from these comparisons, a formerly adapted approach of controlling internet screen time to manage hypochondriasis [30] can be modified likewise.

CONCLUSION

This study aimed at assessing the prevalence of hypochondriasis and its association with internet use in the medical students of Karachi, Pakistan, and it was evident from the results that internet overuse and associated hypochondriasis is quite prevalent in this group of students. Internet overuse has a negative impact on an individual's health satisfaction as well as on other aspects of life; however, insignificant correlations with gender were recorded. Internet overuse is a growing public health problem and its expected rise in upcoming years could possibly worsen the prevalence rates of hypochondriasis and other aspects of an individual's mental and physical health. This necessitates prompt and appropriate interventions directed towards limiting the amount of time these students dedicate to internet use. Knowledge and awareness sessions, both for parents and students about hypochondriasis and the adverse effects of excessive internet use are the needs of the hour. Efficient results at the population level can only be achieved by sustained efforts at the individual level. Input from psychiatric and public health researchers and practitioners is needed to devise and apply the interventions ideal for the management of hypochondriasis.

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