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Research Article

Cyberchondria, Psychological Distress, and Academic Adjustment Among Undergraduate Students in Oman

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Abstract

Background: Cyberchondria refers to the irrational rise in anxiety over one's health as a result of a World Wide Web search for medical information. The purpose of this study was to explore the relationship between cyberchondria, academic adjustment, and psychological distress and among students at an Omani university.

Method: A descriptive correlational design was used to collect data from 339 eligible participants using the short-form version of the cyberchondria severity scale, an academic adjustment scale, and the Kessler Psychological Distress Scale. The questionnaires were distributed over a month in March 2021 at the Sultan Qaboos university colleges.

Result: The majority of the students were male (74.6%, n = 253), single (75.2%, n = 255), lived off campus (82.2%, n = 272), and in their third academic year (35.7%, n = 121). The mean scores of cyberchondria, psychological distress, and academic adjustment were 37.00, 26.55, and 29.34, respectively, indicating a moderate to high level for these students' experiences.

Discussion: Students may benefit from the sharing of expertise and peer-to-peer networking for health-related data via the Internet. However, their academic adjustment and emotional status may also be affected.

Conclusion: Further analysis and strategies should be built to help students effectively track online medical resources for the right reason.

Keywords: Academic adjustment; College students; Cyberchondria; Psychological distress

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Background

Transition to the college environment forces students to face new challenges in which changes in their emotional detachment and social role can lead them to further distress [1]. Being abroad, away from family and friends, may add additional burdens to students' well-being and academic achievements [2].

The adjustment of students refers to their hard capacity and efforts to preserve harmony and equilibrium between their needs, expectations, and environmental demands [3,4]. It refers to the degree of ability by which a person tries to cope with internal pressures, needs, disputes, and agitation, and at the same time it is capable of bringing in harmony between students' inner demands and those placed by the outside world [5].

The adjustment process includes the fulfilment of significant emotional, social, and moral obligations [3] and the restoration of personal relationships and social ties with the new world [6]. Consequently, social adjustment may illustrate how well the students function and develop a professional relationship [7,8]. College transition entails a range of demands that vary in nature and degree and require many responses or changes to deal with them. Not only are students concerned with academics; they are equally affected by social and emotional changes [9].

Multiple factors are considered as risk factors for adjustment issues, such as coping strategy, social support, personal beliefs, self-expectations, educational demands, financial difficulties and homesickness, social stressors, culture shock, social media, modern technologies and various educational factors [10]. New college students, as young people who are introduced to independent lifestyles, are likely to be distressed about independence from parental and family constraints at home just as they also tend to also enjoy this independence in higher learning institutions [11].

The presence of psychological distress reflects the unseen obstacles a student faces, which prevent the student from achieving success. Students are generally effective in equilibrating their financial, social, psychological, and academic education. The more successfully that a student strikes a balance, the more success that student will attain while attempting a college stay [12].

Psychological distress is of rising importance in the form of depression and anxiety. The onset of such suffering is also taking place in young adulthood, when many people are seeking higher education and beginning their careers, which negatively affects their physical, psychological, and academic well-being [13], resulting in many

students leaving university without completing studies [14]. At that moment university students typically show a wide variety of symptoms and health problems such as (1) psychological health concerns; (2) circulatory and respiratory symptoms; (3) gastrointestinal symptoms; and (4) pain and ache [15].

Smartphone addiction has recently become a severe problem among the younger; college students are at the forefront of smartphone use [16], and they rely on its applications to do even the simplest daily tasks [17]. Therefore, they are highly likely to develop frequent or addictive behaviours associated with more negative impacts on health and self-esteem due to positive social rewards and feedback toward their academic achievement, interests, and motivational goals [18].

Internet connections via smartphones and computer applications provide a platform for knowledge-seeking health at lower cost and effort than through offline methods. This provides better awareness of health issues for customers and allows them to find specific explanations for health diagnoses, symptom control, infection prevention, and promotion [19,20].

Cyberchondria is a term used to describe excessive web browsing for health care information seeking. Moreover, it can represent "the pattern of excessive and repetitive online symptom-checking behaviour and purported to be related to underlying health anxiety and non-reassurability" [21]. Cyberchondria involves confusion about the quality of e-health services, the need for detailed 'ideal' explanations for specific symptoms, and selective attention to health information, which poses more questions about user health conditions during online searches, requiring the user to regularly access the Internet for more complex levels of information than were sought previously [22,23] . These individuals will continue to search more in the hope that the frequent checking will reduce their further anxiety and distress [24].

Since some of the health information found online is not scientifically proven [20], the online search for health information can build anxiety, and the rich source of potentially disturbing health information can bring on great feelings of doubt and fear [25].

Individual health self-diagnosis can be troublesome even when using online searches for information. For example, a fast search of the word "cough" through Google leads to many results, ranging from colds to lung cancer. The same thing happens while looking for "finger numbness," which could lead the user to believe that he or she is suffering from spinal or stroke-related diseases [24]. Notably, the use of smartphone applications is found to be useful, since the social interactions through these devices are safe. Self-confidence will be enhanced in comparison with face-to-face contact [26]. In modern social networking, people effortlessly tend to disclose things with others [27] . They may find themselves away from their desired social connections [28] , seeking a unique platform of social support and self-presentation [29,30].

Recently, highly developed and advanced devices like smartphones and laptops have been widely used; while they make life easier for people and improve the terms of contact, sadly the misuse of such devices can negatively affect health conditions. Although some research studies have investigated this effect, none have examined the relationship between cyberchondria and academic adjustment and psychological distress. The current research refers to the lack of established studies and will provide the readers with the requisite knowledge beyond this issue as academic workers. So the current study explored the relationship between cyberchondria, academic adjustment, and psychological distress and among students at an Omani university.

Methods

Approval to conduct the study was obtained from the Research Ethics Committee of the College of Nursing at Sultan Qaboos University (SQU). The researchers used a descriptive correlational study design to achieve the research purpose among SQU undergraduate students.

A sample size of 373 students was used in this study. The size of the sample was determined by using a power analysis with the following parameters: confidence level 95%, margin of error 5%, population proportion 50%, and population size approximately 12000 students. The sample consists of those students who met the eligibility criteria of being enrolled in the undergraduate program, having completed their foundation programs, and having at least one smartphone device continuously connected to the Internet. However it exclude those students who are registered in postgraduate studies, who are not completing their foundation program in which they extensively study English language and computer, and technology science, and those who don't have smartphone devise, or not being able to connect his mobile to internet.

The university Information Centre provided the authors with a list of all students' emails. Then the participants were chosen randomly by the researcher for their participation, using a method by which an email was sent to Sultan Qaboos University email addresses beginning with the student number (e.g., s1250xx@squ.edu.om). The email asked prospective participants to take part in the research and also solicited written informed consent following an explanation of the study design, purpose, methods, and potential benefits; the message also assured participants about their voluntary and confidential participation.

Once the participants completed the questionnaire, they could return it via email or put it in a locked box in a specific place in the college of nursing. No students' identifying was collected. The questionnaires were distributed over the month of March 2021 by the research team at the Sultan Qaboos university colleges. Each student required approximately 20–25 minutes to complete the questionnaire.

Study instruments

A self-report instrument was utilized to investigate the extent of the research phenomena. The instrument consisted of (1) questions to gather demographic data, including participants' gender, age, living arrangements, academic year, and marital status; (2) the short-form version of the cyberchondria severity scale (CSS-12); (3) an academic adjustment scale; and (4) the Kessler Psychological Distress Scale (K10). The researcher used the original scales' language as the study language at Sultan Qaboos University in English.

Short-form version of the cyberchondria severity scale (css-12)

The cyberchondria severity scale is a brief, reliable, and valid measure of worry/anxiety attributable to excessive online health research. Developed by McElroy et al. (2019), the scale consists of 12

items that are rated on a 5-point Likert scale ranging from 1 ("never") to 5 ("always"). An example item is, "If I notice an unexplained bodily sensation, I will search for it on the Internet." The CSS-12 scale demonstrated good internal consistency, as stated by the authors, with higher scores showing increased levels of awareness. Approval was obtained to use the tool from the author.

Academic adjustment scale

The scale was created by [12] to focus on local and sojourner students who are temporarily relocated to a new learning environment. It comprises three subscales: academic lifestyle, academic achievement, and academic motivation. The participants are requested to rate their responses on nine items using a 5-point Likert scale ranging from 1 ("rarely applies to me") to 5 ("always applies to me"). An example item is, "I am satisfied with my ability to learn at the university." The score ranges between 9 and 45, with the lowest score showing lower academic adjustment. The scale demonstrates a strength of test–retest correlation coefficients, temporal stability, and internal consistency [12]. Approval was obtained to use the tool from the author.

Kessler psychological distress scale (k10)

The Kessler Psychological Distress Scale (K10) is a simple measure of psychological distress. The K10 scale involves ten questions about emotional states, each with a five-level response scale. Each item is scored from 1 ("none of the time") to 5 "all of the time"). Scores of the ten items are then summed, yielding a minimum score of 10 and a maximum score of 50. Low scores indicate low levels of psychological distress, and high scores indicate high levels of psychological distress. The scale demonstrates a strength of test–retest correlation coefficients, temporal stability, and internal consistency [31]. The tool is available free online.

Data analysis

The data were analysed using the Statistical Package for the Social Sciences (SPSS) software at a 0.05 level of significance. Mean and standard deviations represented students' age, the number of smartphones, and the scores for academic adjustment, cyberchondria, and psychological distress. Percentages and frequencies were used to describe student gender, marital status, living arrangement, and level of academic years. Further, multiple regression was used to determine whether academic adjustment and psychological distress predicted the experiences of cyberchondria. Four hundred emails were randomly sent to the students, of which 370 participants returned the questionnaire, giving a response rate of 92.5%. The researcher attempted to do data cleaning for all missing and incomplete information, as well as to handle delayed submissions and ineligible participation. The researcher excluded all students who were enrolled in postgraduate work and those who did not complete the foundation program (English, computer skills, and mathematics, which is almost completed in the first academic year). After data cleaning, the sample consisted of 339 participants Table 1.

Variable	Frequency	Percentage	Variable	Frequency	Percentage
Age			**Gender**		
18-20	89	26.3	Male	253	74.6
21-23	197	58.1	Female	86	25.4
24-27	53	15.6			
Academic year			**Living Arrangement**		
1	34	10.0	out-campus	272	80.2
2	69	20.4	in-campus	67	19.8
3	121	35.7	**Marital Status**		
4	53	15.6	Single	255	75.2
5	62	18.3	Married	84	24.8

Table 1: The age of the respondents ranged from 21 to 23 years. The majority of the students were male (74.6%, n = 253), single (75.2%, n = 255), lived off campus (82.2%, n = 272), and in their third academic year (35.7%, n = 121).

More than 80% of our study participants indicated that they used their smartphone application for health purposes, the main reasons for which were the availability of the information (45.13%), and easy accessibility (25.07%). The participants indicated that the main aspects of using online health information-seeking applications were to identify their current health condition (50.44%), followed by changing treatment modalities (20.06%), and discussing health issues with a health professional (12.09%). As the consequences of browsing these health applications, the participants indicated that they upgraded their health searches (24.78%) and consulted their professional health care providers (18.58%). Table 2.

Response	Frequency	Percentage
Daily use of smartphone		
1-2 hours	90	26.5
3-4 hours	77	22.7
5-6 hours	172	50.7
Use of smartphone application for health purposes		
Yes	279	82.3
No	60	17.7
The primary reasons for using smartphone applications for health purposes compared to other traditional methods		
The vast amount of valuable information available	153	45.13
Anonymous, private, and confidential	20	5.90
Easy to find information	85	25.07
Cheap	15	4.42
Convenient and easy to communicate	30	8.84
Less embarrassing	36	10.62
The main aspects of using online health information seeking applications		
Identifying current health condition	171	50.44
Making, canceling, or changing appointment with a doctor	23	6.79
Discussing health issues with a health professional	41	12.09
Changing treatments modalities	68	20.06
Change of lifestyle	18	5.32
Follow updated health information	13	3.85
Others	5	1.47
The primary responses to health application instructions		
Check for another application for validation	53	15.64

Do further upgraded search	84	24.78
Consult the health profession	63	18.58
Share results with family and friends	36	10.62
Follow the app instructions	42	12.39
Ignore the app instructions	52	15.34
Others	9	2.65

Table 2: pattern of using a smartphone application for health-seeking information.

The results also highlighted significant differences in cyberchondria according to study participants' gender (P = .002), living arrangement (P = .001), and academic year (P = .001). However, the researcher did not find any significant differences in academic adjustment and psychological distress based on the participants' demographics. Table 3.

Variable	cyberchondria Significant at p < 0.050	Academic Adjustment Significant at p < 0.050	Psychological distress Significant at p < 0.050
Age			
18-20	Not significant F=.053 P=.949	Not significant F=.023 P=.997	Not significant F=.155 P=.857
21-23			
24-27			
Gender			
Male	Significant F=9.816 P=.002	Not significant F=1.224 P=.269	Not significant F=2.539 P=.112
Female			
Marital Status			
Single	Not significant F=.007 P=.934	Not significant F=.001 P=.977	Not significant F=.372 P=.542
Married			
Living Arrangement			
out-campus	Significant F=10.913 P=.001	Not significant F=2.385 P=.123	Not significant F=.222 P=.642
in-campus			
Academic year			
1	Significant F=4.844 P=.001	Not significant F=2.284 P=.060	Not significant F=1.802 P=.128
2			
3			
4			
5			

Table 3: Distribution of cyberchondria experiences, academic adjustment, and psychological distress based on students' demographical characteristics.

The reliability of the three tools was assessed in our sample and showed a high Cronbach's α value; cyberchondria (.935), Academic adjustment (.923) and Psychological distress (.919).

A composite score of each tool was calculated by summarizing the students' responses to the questionnaire; the mean scores of cyberchondria, psychological distress, and academic adjustment were 37.00, 26.55, and 29.34, respectively. These scores indicate a moderate to high level of cyberchondria, psychological distress, and academic adjustment.

The study used multiple linear regression to assess the ability of psychological distress and academic adjustment to predict the level of cyberchondria among undergraduate students; Table (4) summarizes the descriptive statistics and analysis results. After controlling for the influence of confounding variables, a higher level of cyberchondria was found to be positively and significantly associated with higher academic adjustment (P = .000) and psychological distress (P = .000). Indicating that those with higher scores on these variables tended to have a higher score of cyberchondria, the multiple regression model with the two predictors produced R^2 = .782, F = 596.39, and P < 0.01. Academic adjustment and psychological distress explained 78.2% of the variation in cyberchondria experiences. Table 4.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant) b	4.083	1.005		4.061	0	2.105	6.06
Academic adjustment	0.681	0.063	0.519	10.891	0	0.558	0.805
Psychological distress	0.499	0.059	0.401	8.411	0	0.383	0.616

Table 4: Result of the multiple linear regression analysis.

a. Dependent Variable: cyberchondria

b. Predictors: (Constant), Academic adjustment, Psychological distress

Discussion

Few studies have been conducted, especially among college students, concerning the problematic use of the smartphone, particularly fear of missing out. This study was a preliminary step toward understanding the predictors of this phenomenon among college students in Oman. More than 80% of our study participants indicated that they used their smartphone application for health purposes; this claim is supported by another previous study [32]. The reason for this behaviour may be due to the college facilities, where its campuses have Internet connections freely available in high quality and speed; additionally, college students are relaxed with technology because they have grown up with it.

The main reasons for using smartphone applications for health purposes are the availability of the information (45.13%) and easy accessibility (25.07%), which are also confirmed by Obasola and Agunbiade (2016), who found that more that 70% of their study participants had an opportunity to easily seek information on their health conditions through online sources. The participants in that study indicated that the main aspects of using online applications to seek health information were to identify their current health condition (50.44%), followed by changing treatment modalities (20.06%) and discussing health issues with a health professional (12.09%). This claim is also supported by another previous study [32]. Online communities could be known as a forum for health practitioners to help young people deal with online knowledge, as Buame pointed out [33].

In the current study, as the consequences of browsing these health applications, participants indicated that they upgraded their health

searches (24.78%) and consulted their professional health care providers (18.58%). This could be supported by the efforts of Escoffery and colleagues, who found that 89% of students who participated in their study did not find the desired health information and had unfulfilled needs [34]. In that claim, it seems that it is very important to incorporate online-based curriculum and university student wellness services, and to educate students to browse the Internet for medical information and to evaluate the online health information properly in addition to seeking professional medical health consultation.

Our research found a moderate to high level of cyberchondria, psychological distress, and academic adjustment which is supported by other previous studies [35,36]. This might be due to university students having found themselves away from their desired social connections due to their academic requirements [28]; therefore they sought a unique platform of social support, emotional expression, and self-presentation [29,30]. They can also be inspired to spend time performing health-related Internet searches to achieve clarity about their health concerns, to neutralize their health-related worries, and to eliminate suspicions as acute health questions are perceived [37]. We may assume that the fulfilment of psychological needs is a significant factor involved in the relationship between cyberchondria, which can be expressed by the excessive use of social media platforms and their academic succeed [38,39].

The results of the current study highlight significant differences in overall cyberchondria scores according to participants' gender, living arrangement, and academic years. For example, women (mean = 40.50) scored a higher level of cyberchondria than men (mean = 35.81), which is not consistent with other previous studies [40]. The reason may be that in Middle Eastern countries women are more likely to use smartphone applications and search engines to fulfil their social and psychological demands by disclosing things to others and finding influential people or stylized body figures to follow, compared to men, who have a more acceptable leadership role and responsibility for the whole family and are more likely to use the Internet for learning purposes, entertainment, and social connections [40,41].

The results of this study also indicated significant differences for cyberchondria based on the students' living arrangement. Those students who lived on campus (mean = 41.33) scored higher than those who lived off campus (mean = 35.93), which may be due to the fact that on-campus students may experience more maladaptive behaviour that can contribute negatively to their psychological well-being, leading them to experience symptoms of anxiety and to constantly browse the Internet to have a constant platform of social support, healthy practices, and health promotion that provides quick, accessible, and affordable access to health care and health information [32]. Another explanation could be due to the availability of on-campus Internet connections, including free campus-wide WiFi and computers and labtops, and the ease with which students can use them [42].

The results of this study also showed significant differences of cyberchondria experiences according to students' academic year. Students in their second academic years (mean = 41.55) had the highest level of cyberchondria compared to those in the third, fourth, and fifth academic years (mean = 36.42, 35.28, and 37.62, respectively). On the other hand, students who were in the first academic year had the lowest score of cyberchondria (mean = 31.35), which is inconsistent with other previous works, in which the majority of first-academic-year students scored high levels of cyberchondria [43]. This may be due to the fact that students in the second academic year start to receive additional academic work and comprehensive assignments, which may add more psychological and physical burdens on their health status, leading them to search more for health-related information, before they can adapt more effectively to their study requirements and build more social connections and support [44].

The finding of this study indicated a significant positive correlation between cyberchondria experiences and both psychological distress and academic adjustment among undergraduate students in Oman. The results indicate that those with higher scores of psychological distress and academic adjustment tended to have a higher score of cyberchondria. Several studies have postulated a significant relationship between smartphone overuse in terms of Internet browsing and both psychological distress and cyberchondria [45-47]. Emotions as a part of the individual variables can play a crucial role in determining the individual's behaviour in seeking information. Psychological distress has been negatively linked to self-efficacy in stressful situations and health evaluation through self-assessment using mobile apps [48].

Our results suggest that students spend more time on the smartphone for everyday usage, experiencing more self-recognition and positive acknowledgment, and they are likely to develop frequent or addictive behaviours due to positive social rewards and feedback toward their academic achievement, interests, and motivational goals [49]. As a consequence, fear and anxiety, the key aspect of cyberchondria, and the initial phases of the information-research process may be maximized [50]. Thus, the continuous quest for information to increase optimism and confidence can cause information overload and elicit information anxiety [51]. Besides, students with cyberchondria may also be unnecessarily worried about the welfare of others such as close family members or friends, that may also affect their emotional well-being [25].

Transition to the college environment requires students to confront new challenges—physical, psychological, and intellectual—which can change their emotional attachment and social position, leading to more anxiety in order to achieve a higher level of academic adjustment [1]. Students therefore want to maintain a sense of harmony with their current learning climate [49] and to find a constant platform of social connection and information-seeking resources through their supportive system such as family and friends or any health-related applications and search engines [52].

For new students with fewer qualifications and less experience, when exposed to any new health condition, they may spend hours monitoring television and social media platforms displaying information on health conditions, treatment modalities, recovered instances, and even health consequences. This can significantly worsen their anxiety [53,54] or create social comparisons, leading them to feel inferior and have negative evaluations of themselves [54]. Moreover, individuals with cyberchondria may also be overly concerned about the health of others, such as close family members or friends, which is sometimes considered the soul of individuals' emotional interactions that may also affect their emotional status and college adaptation. Thus, it is highly recommended that those students are offered reliable sources of information to avoid myths, rumours, and misinformation that can feed into their anxiety. These reliable resources could include frequent health awareness programs and health-related elective college courses that highlight the efforts of the World Health Organization (WHO), the Centre for Disease Control and Prevention, the

Centre for Health Security, and the National Health Service in health awareness and disease prevention. Combining a stress-reduction intervention with an educational program for enhancing hardiness and the adoption of protective mental health measures before graduation under such stressful conditions might be more effective in improving the mental health status of college students during their academic life.

The data show some limitations. First, data collection was from only one Omani national university, which may limit the generalizability of the findings; thus, future studies would require more universities from various Omani governorates. Future studies should also discuss more predictors for experiencing cyberchondria, such as self-expectations, self-esteem, social support, and study exhaustion [54].

Conclusion

The results of this study indicated a moderate to high level of cyberchondria experiences, psychological distress, and academic adjustment. There was a significant association between psychological distress, academic adjustment, and cyberchondria. This research highlights the emerging pattern of cyberchondria perception in terms of psychological and well-being awareness and anxiety. Students are also drawn by the ease of access to data, the potential to gather more health information electronically than through other sources, and the ability to receive this information anonymously.

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