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Cyberchondria, Uncertainty, and Psychological Distress during COVID-19: An Online Cross-Sectional Survey

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Abstract: This study aimed to explore the relationship between cyberchondria, psychological distress, and uncertainty in Oman during the COVID-19 pandemic. A descriptive cross-sectional study was conducted. Data was collected through an online survey from 393 Omani participants using the short-form version of the Cyberchondria Severity Scale, the Kessler Psychological Distress Scale, and the Intolerance of Uncertainty Scale. Means, standard deviations, percentages, and frequencies were used to describe the participants' demographic information. Independent t-test and Pearson correlation were used to conclude. The results showed that most participants were aged between 18-26 and 45-54 years (32.8% and 30.8%, respectively). Almost three-quarters of the participants were female ($n = 291$, 74%) and half were single ($n = 218$, 55.5%). No significant associations were found between cyberchondria and the socio-demographic factors or the COVID-19 status. However, a significant positive fair correlation was found between cyberchondriac experiences and psychological distress ($r_s = 0.373$) and cyberchondria and uncertainty ($r_s = 0.442$); $p < 0.05$. To the best of our knowledge, this study is the first of its kind investigating the relationship between cyberchondria, physiological distress, and uncertainty among the Omani population. Policymakers and stakeholders are encouraged to facilitate the reporting and observation of accurate and up-to-date information distributed to the population to avoid misleading information and thus reduce the distress and uncertainty related to cyberchondriac behaviors.

Keywords: cyberchondria, uncertainty, COVID-19, psychological distress.

新冠肺炎 期間的網絡軟骨病、不確定性和心理困擾：在線橫斷面調查

摘要: 本研究的目的是探討 新冠肺炎大流行期間阿曼的網絡軟骨病、心理困擾和不確定性之間的關係。進行了描述性橫斷面研究。數據是通過使用網絡軟骨病嚴重程度量表、凱斯勒心理困擾量表和不確定性不容忍量表的簡短版本對 393 名阿曼參與者進行的在線調查收集的。均值、標準差、百分比和頻率用於描述參與者的人口統計信息。使用獨立 t 檢驗和皮爾遜相關來得出結論。結果顯示，大多數參與者的年齡在 18-26 歲和 45-54 歲之間（分別為 32.8% 和 30.8%）。幾乎四分之三的參與者是女性（ $n=291$ ，74%），一半是單身（ $n=218$ ，55.5%）。未發現網絡軟骨病與社會人口因素或 新冠肺炎狀態之間存在顯著關聯。然而，網絡軟骨病經歷與心理困擾（ $r_s = 0.373$ ）、網絡軟骨病和不確定性（ $r_s = 0.442$ ）之間存在顯著的正相關關係； $p < 0.05$ 。據我們所知，這項研究是同類研究中首次調查阿曼人口中網絡軟骨病、生理不適和不確定性之間的關係。鼓勵政策制定者和利益相關者促進對分發給民眾的準確和最新信息的報告和觀察，以避免誤導信息，從而減少與網絡軟骨病行為相關的困擾和不確定性。

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关键词： 網絡軟骨病，不確定性，新冠肺炎，心理困擾。

1. Introduction

Almost 60% of the global population are actively using the internet for different reasons, and one of the main reasons is a source of knowledge about wellbeing [1]. For example, 60% of adults in the United Kingdom searched for health information using the internet [2], and in Turkey, 92.4% of pregnant women searched the internet to obtain information about childbirth [3]. People seek health-related websites for many reasons, such as learning about a particular disease and its treatment, comparing their prescribed treatment with others, exploring other higher-quality medication than that prescribed for them, shopping for non-prescription medicines and herbal remedies [4].

People also benefit from these online services by joining therapy groups and communicating with those with similar illnesses to express feelings and concerns and share ideas to counteract and cope with their illness [5]. While it is considered as a great technological benefit as well as a time- and money-saver, surfing the internet for health-related information can have unfortunate consequences when it becomes the only source of diagnosis and treatment for individuals, increasing their anxiety about their health or what is called cyberchondria [4, 6, 7].

The signature aspect of this disorder is compulsivity in internet searching, which puts the users in front of much information. As a result, they are overwhelmed by the information retrieved, increasing their uncertainty [6]. Uncertainty is an associated factor with anxiety and depression [8]. It is also associated with obsessive-compulsive symptoms [9], emotional problems, and psychosis [10]. People who have a high level of uncertainty portray biases toward ambiguous triggers and atypical decision-making processes, like the need for more evidence (excessively search the internet) before making decisions, which increase their level of psychological illnesses [11].

The feeling of uncertainty amplified in the presence of the plethora of information about the illness. An exponential study was conducted to study the association between the uncertainty and the amount of information received. One group received relatively less information about HPV compared with their counterparts. Results showed that people who received more information were more uncertain and consequently experienced a higher stress level [14].

In this context, the world faced a deadly, unknown, and highly contagious disease called COVID-19. The government, as a result, put a restriction on the people's movement, including quarantining people in their homes and encouraging people to not socialize in groups. This makes people depend on and surf the

internet for longer hours which potentially increases problematic Internet use [12], including the increase of online gaming; [13] watching online pornography [14], and excessive searching for more health information about the COVID-19 [15]. [15] explain this, people in the presence of COVID-19 feel vulnerability and fear, particularly in the lack of information, which increases their uncertainty. This will guide them to search the internet to overcome fear and uncertainty. However, people face a plethora of updated information every day, and they lose the ability to judge the trustworthiness of this information. The result is more uncertainty and psychological distress.

There is a dearth of literature exploring cyberchondria among people in the Middle East. However, with convenient access to the internet, health-related information availability, the psychological distress associated with quarantine, and the mysterious nature of COVID-19, the number of people with cyberchondria is likely to increase. We aim to examine the relationship between cyberchondria, physiological distress, and uncertainty in Oman.

2. Materials and Methods

2.1. Study Design and Procedures

A descriptive cross-sectional study design was used. A sample of 393 participants was recruited using a convenience sampling technique (non-probability sampling) to minimize the costs and time for data collection. The researchers recruited the participants through social media, namely groups in Facebook and WhatsApp. The online survey was open throughout April 2020, took each participant about 20-25 minutes to complete.

The inclusion criteria were to be: (a) holding Omani citizenship, (b) willing to participate in the study, (c) signing informed consent for participating in the study, and (d) being older than 18 years.

The sample size was determined based on Solvin's formula ($n = N/(1+Ne^2)$), in which N stands for the population size and e is the margin error (0.05). Almost the total number of Omani populations aged older than 18 equals 1,366,803 (NCSI, 2018). The total expected sample size after applying the formula is ($n= 396$) participants.

2.2. Ethical Approval

Prior to data collection, ethical approval was obtained from the College of Nursing Scientific Research and Ethics Committee, Sultan Qaboos University (Ref.nr.: CON/NF/2020/15). The survey page was introduced with a short description of the

study design, objectives, methodology, and potential benefits of the survey, ensuring the respondents' voluntary and confidential participation. By answering the survey, the participants gave their consent. No personal data was collected, so the participants' confidentiality was not an issue.

All electronic data was saved on a password-protected computer, and only the research team members could access the database.

2.3. Study Instruments

The researchers used a self-reporting questionnaire to measure the extents of the research phenomena, consisting of (1) demographic data; (2) the short-form version of the Cyberchondria Severity Scale (CSS-12); (3) the Kessler Psychological Distress Scale (K10); and (4) the Intolerance of Uncertainty Scale, short-form (IUS-12).

2.3.1. The Short-Form Version of the Cyberchondria Severity Scale

The CSS-12 is a brief, reliable, and valid tool to measure worry/anxiety attributable to excessive online health searches [16]. 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 reliable internal consistency, as stated by the authors, with higher scores indicating increased levels of awareness [16]. Permission to use the survey was obtained from the owner of the instrument prior to the data collection. The survey is valid and reliable. Cronbach's alpha was 0.91 in previous research [17]. In the current study, it was 0.87.

2.3.2. Kessler Psychological Distress Scale

The K10 scale is composed of ten questions concerning emotional states, measuring psychological distress. Each item has a response scale of five levels, from 1 = "never" to 5 = "all of the time". The total score is the sum of the ten questions, and a high score indicates a serious level of psychological distress. The scale demonstrates the strength of test-retest correlation coefficients, temporal stability, and internal consistency [18]. The survey is available in the public domain with permission to use for non-profit purposes. The survey is valid and consistently shows very good reliability reliable scores. Cronbach's alpha was 0.91 – 0.93 [19], and in the current study, it was 0.93.

2.3.3. Intolerance of Uncertainty Scale, Short Form

Carleton developed this scale, Sharpe [20], to assess the responses of individuals to uncertainty and ambiguous situations. It consists of 12 items rated on a five-point Likert scale from 1 (not at all characteristic of me) to 5 (entirely characteristic of me). Possible

scores range between 12 and 60, with higher scores reflecting greater uncertainty. The scale demonstrated good validity and reliability. Cronbach's alpha was 0.85 [20], and in the current study, it was 0.873. Permission to use the survey was obtained in advance from the owner. Please see Figure 1.

2.4. Statistical Analysis

The data was downloaded from the Google forms in Excel format, then transferred to the Statistical Package for the Social Sciences (SPSS) program version 23 for the analysis. The data set was checked for missing data, and no missing data were found. All variables, including age, were on a categorical level except for the total scores of the questionnaires (CSS-12, K10, and IUS-12). Means, standard deviations, percentages, and frequencies were used to describe the participants' demographic information. Independent t-test and Pearson correlation were used to conclude. The statistical significance was set at $p < 0.05$.

The Independent t-test was performed to explore whether there is a significant difference between the mean score of the cyberchondria experience as the dependent variable and selected sample characteristics as independent variables. The Independent t-test was selected because the dependent cyberchondriac experiences were normally distributed. The sample is independent and randomly selected.

The normality was checked using Q-Q plots. The Pearson correlation coefficient was used to test the bivariate relationship between the dependent variable cyberchondria experience and the dependent variables of experienced psychological distress, uncertainty, and hours spent surfing the internet. All variables were normally distributed, and there was a linear relationship between them. The normality was checked using Q-Q plots, and the linear relationship was assessed using a Scatter plot.

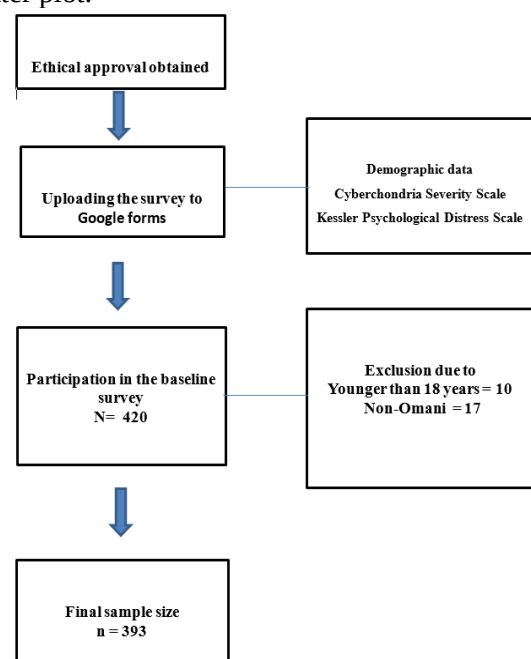


Fig. 1 Flowchart of the research methodology

3. Results

Three hundred and ninety-three participants completed the online survey. The majority were aged between 18-26 and 45-54 years old (32.8% and 30.8%, respectively). Almost three-quarters of the participants were female ($n = 291$, 74%), half were single ($n = 218$, 55.5%), three-fifths have a university degree ($n = 236$, 60.1%), and two-fifths receive less than 160 RO monthly ($n = 162$, 41.2%). Furthermore, a large majority of the participants have no history of chronic illness ($n = 341$, 86.8%), mental illness ($n = 375$, 95.4%), or a family history of mental illness ($n = 318$, 80.9%). A very small number ($n = 11$, 2.8%) of the participants confirmed themselves as a positive COVID-19 case; one in ten ($n = 37$, 9.4%) had been quarantined, and three-fifths ($n = 236$, 60.1%) thought that they were at high risk of COVID-19 infection (Table 1).

Table 1 Sample characteristics ($n = 393$)

Variable	n	%	Variable	n	%
Gender			Marital Status		
Male	102	26.0	Single	218	55.5
Female	291	74.0	Married	175	44.5
History of mental illness			Family members have a mental illness		
Yes	18	4.6	Yes	75	19.1
No	375	95.4	No	318	80.9
History of chronic disorder			Exposed to a person with COVID-19		
Yes	52	13.2	Yes	48	12.2
No	341	86.8	No	345	87.8
Diagnosed with COVID-19			Risk of COVID-19		
Yes	11	2.8	Yes	236	60.1
No	382	97.2	No	157	39.9
Quarantined			Age		
Yes	37	9.4	18 – 26	129	32.8
No	356	90.6	27-35	46	11.7
Salary			36-45	97	24.7
Less than 160	162	41.2	46- older	121	30.8
160-500	38	9.7	Education		
501-1000	97	24.7	Less than higher education	48	12.2
1001-1500	66	16.8	Diploma	109	27.7
More 1500	30	7.6	Higher education	236	60.1
Cyberchondria Severity Scale*			m (SD)		
Kessler Psychological Distress Scale*			30.7 (9.8)		
Intolerance of Uncertainty Scale*			23.4 (10.2)		
Surfing the Internet hrs/day			35.1 (10.0)		
			5.2(3.55)		

* Min-max range for Cyberchondria Severity Scale is 12-60, Kessler Psychological Distress Scale is 10-50, and Intolerance of Uncertainty Scale is 12-60. Higher scores indicate greater severity, distress, and uncertainty.

In the group comparison phase, there was no statistically significant difference between cyberchondriac experience and gender ($p = 0.595$); marital status ($p = 0.600$); history of mental illness ($p = 0.166$); history of chronic illness ($p = 0.585$); being diagnosed with COVID-19 ($p = 0.093$); or being at risk from COVID-19 ($p = 0.276$) (Table 2).

Table 2 Relation between cyberchondriac experiences and socio-demographic characteristics

Variable	Category	Depression m (SD)	p
Gender	Male Female	30.2 (9.4) 30.8 (10)	0.595
Marital status	Single Married	30.4 (10.4) 30.9 (9)	0.600
History of mental illness	No Yes	30.5 (9.7) 33.7 (11.1)	0.166
Family member with mental illness	No Yes	30.3 (9.7) 32 (9.9)	0.537
History of chronic illness	No Yes	30.7 (9.7) 30.2 (10.3)	0.585
Contact person with COVID-19	No Yes	30.9 (9.5) 29 (11.3)	0.216
Diagnosed with COVID-19	No Yes	30.5 (9.7) 35.5 (11.8)	0.093
Being at risk of COVID-19	No Yes	31.3 (9.7) 30.2(9.8)	0.276
I have been quarantined for 14 days	No Yes	30.6 (9.5) 31(12.2)	0.783

A Pearson correlation analysis indicated that there was a significant positive fair correlation between cyberchondriac experiences, psychological distress ($r_s = 0.373$, $P < 0.05$), and uncertainty ($r_s = 0.442$, $P < 0.05$) (Table 3).

Table 3 Correlations between cyberchondria experiences, psychological distress, uncertainty, and hours spent using the internet

	1	2	3	4
Cyberchondriac experiences	1	.373**	.442**	.029
Psychological distress	.373**	1	.586**	.018
Uncertainty	.442**	.586**	1	.015
Internet use/hrs	.029	.018	.015	1

** Significant correlations at $p < 0.05$

4. Discussion

This study aimed to investigate the relationship between cyberchondria, psychological distress, and uncertainty among the adult population of Oman. Our results show a significant fair, positive correlation between cyberchondria and psychological distress as well as uncertainty. Furthermore, no significant difference between the cyberchondria and the socio-demographic factors. These findings are in line with other studies showing, for example, no association between gender and cyberchondria [21] or between age

and cyberchondria [22]. The current study results suggest the need for a wider investigation of socio-demographic factors, such as level of education and health literacy, on the information-seeking behaviors of different populations.

However, there is a significant fair, positive correlation between cyberchondria and psychological distress and uncertainty. The relationship between cyberchondria and psychological distress has been studied previously, and our findings are similar to those from other international populations [8, 23]. Previous studies have identified positive associations between cyberchondria, health anxiety, and COVID-19 anxiety [24], anxiety and health information-seeking behaviors [25], and cyberchondria and gender. [22] Our finding was also to findings in the region. The most recently published study from Bahrain showed that information-seeking behaviors through the internet caused moderate to severe anxiety problems in 18% of the participants during the COVID-19 pandemic [25]. Therefore, decision-makers and healthcare providers at the national level should increase awareness of the risk of extensively searching the internet about COVID-19. They need to provide full information about the trustful websites regarding COVID-19 that people can rely on. In this regard, decision-makers need to create a hotline to answer people's questions, reducing people's dependency on the internet. A recent study showed that in the presence of health care providers, people show less tendency to rely on the internet [26].

Cyberchondria and uncertainty were found to have a significant fair, positive association in our sample. No previous studies have investigated this relationship in the Middle Eastern context, although international studies have shown the synergistic effect of uncertainty on cyberchondria and psychological distress [7]. Evidence for a unique relationship between the uncertainty inhibitory factors and medical professionals' mistrust was interpreted as a cyberchondria-relevant construct [27]. Thus, the relationship between cyberchondria and uncertainty is important when encountering anxious or worried patients in clinical settings. Healthcare providers need to adjust their approach to the needs of patients to gain their trust and thus their adherence and compliance to the medical and self-care guidance.

5. Conclusion

It is worth mentioning that the results of the current study are somewhat limited by the nature of the cross-sectional design, the convenience sampling technique, and self-reporting, all of which may affect the generalizability of the results to other populations. However, the variety of the study sample concerning age and gender distribution may be considered representative of the local Omani population.

In conclusion, the current study is the first of its kind in Oman, which sheds some light on the status of

cyberchondria, psychological distress, and uncertainty among the general Omani population at the time of COVID-19 with implications for further studies, practical healthcare provision, and policymaking. The current study should be repeated in future research, with the sample size increased to confirm our findings. Further, for the healthcare and public health sectors, emphasis should be on the possible distress and uncertainty that cyberchondria may lead to, especially in times of global pandemics, hence affecting the relationship between the healthcare provider and the client. Last but not least, policymakers and stakeholders need to develop reliable sources of health information at the national level, creating a social media platform [28, 29] that provides accurate and up-to-date information about the current situation, and taking measures to combat any source spreading of misinformation through the traditional or social media.

6. Ethics Approval and Consent to Participate

Prior to data collection, ethical approval was obtained from the College of Nursing Scientific Research and Ethics Committee, Sultan Qaboos University (Ref.nr.: CON/NF/2020/15). The survey page was introduced with a short description of the study design, objectives, methodology, and potential benefits of the survey, ensuring the respondents' voluntary and confidential participation. By answering the survey, the participants gave their consent. No personal data was collected, so the participants' confidentiality was not an issue. All electronic data was saved on a password-protected computer, and only the research team members could access the database. The participants with COVID-19 have not been reported in any other submission by this author team and, to our knowledge, not by anyone else.

7. Availability of Data and Materials

The data supporting this study's findings are available in [Mendeley repository] at [http://doi.org/\[10.17632/4w2tx3mr46.1\]](http://doi.org/[10.17632/4w2tx3mr46.1]).

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