

Online Health Information Seeking Behavior and Thriving Quotient in the COVID-19 Pandemic: The Mediating Role of Mental Toughness

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Abstract

Accurate and dependable health information has been shown to support students' thriving capacity and overall well-being, especially during a pandemic, when students' well-being is critical. The issue is unclear as to what truly supports the established link between students' ability to thrive in the event of a COVID-19 pandemic. This study looks at the correlation between online health information seeking behavior (OHSIB) and thriving quotient (TQ) and the role of a positive construct known as mental toughness (MT). Researchers enrolled 830 males and females from universities in the Philippines. Online Health Seeking Information Behavior (OHSIB-12), the modified and adapted Mental Toughness Questionnaire (MTQ-18), and the Thriving Quotient (TQ-30) were used as accurate and legitimate research instruments. We discovered meager levels of MT and TQ subcomponents and a high level of OHSIB in most university students. Correlation analyses revealed a positive relationship between online health information seeking behavior, mental toughness, and the thriving quotient. Mediation analysis revealed a significant mediation effect, but only on a partial scale. Developing a healthy online information search can assist students in making healthier choices, which in turn helps them feel better, thrive in an uncertain world, and achieve academic success. Mental toughness is also critical for students to access reliable health information online and thus achieve their goals even in the event of a pandemic. Proper guidance from education and health authorities was recommended for students' OHSIB. The implications of the findings for future research were discussed.

Keywords: mental toughness, online health information, pandemic, thriving quotient

Background of the Problem

For a large number of students, the COVID-19 pandemic created an unprecedented level of concern. Fear and anxiety about the new disease and what might happen have impacted them in a variety of ways (Center for Disease Control and Prevention, 2020). With the psychological difficulties and pressures they are currently experiencing, it is reasonable to expect that their academic performance will suffer in varying degrees (Iglesias-Pradas et al., 2021; Mahdy, 2020). Being able to thrive rather than simply survive during a period of vulnerability to one's mental and physical health is a significant task that every student should undertake. The literatures emphasize that when an individual is thriving, he or she has an advantage over numerous obstacles and abrupt changes (Richardson et al., 2012; Siegel & Siegel, 2014). Thriving was even emphasized as a critical component of college students' success (Lloyd, 2019). As the COVID-19 pandemic continues, more people are conducting accelerated online health searches for symptoms of physical or mental illnesses. While physical and mental health concerns are not new in higher education, the pandemic increased students' vulnerability to feelings of sadness, demotivation, and even anxiety as a result of the isolation and university closures, which impacted their academic performance and overall well-being (Centers for Disease Control and Prevention, 2020; Elmer et al., 2020; Zhang et al., 2021). Under these conditions, their capacity to thrive is expected to dwindle.

Because health is one of the most vital aspects of life, it is reasonable for each individual to be concerned about their health and value the ability to take care of themselves through access to health information (Shehata, 2020). Online health information seeking has been shown to aid in informed decision making, increased knowledge, increased trust in medical experts, increased self-care ability, increased quality of life, increased hope and empowerment, and decreased fears and anxiety (Chu et al., 2017a; Finset et al., 2020; Lambert & Loiselle, 2007; Singh & Brown, 2014). However, unreliable online health information proliferates on the internet, particularly during pandemics. Unfortunately, when students lack access to reliable health information, their academic success suffers (Ashkanani et al., 2019; Centers for Disease Control and Prevention, 2019). Thus, it is prudent to verify the website first in order to access reliable information, particularly during a pandemic (Joshi et al., 2020). When a student searches for information on unverified websites, such as some unverified posts on social media, and is presented with unreliable information, the potential for an improvement in his or her overall health and well-being is palpable (Ahmad & Murad, 2020; Maftai & Holman, 2020). Given the implied negative and positive effects from the recently published studies of online health information access on students' academic success or ability to thrive during a pandemic, an imperative trait may be strengthening the association. Recent studies presented the theoretical underpinnings for the relationship between online health information seeking behavior and thriving quotient.

As a result, the current study hypothesizes that mental toughness may be a specific personality trait that would enable students to access reliable health information and thrive in the event of a pandemic. Hypothetically, they can control their thoughts, manage their emotions, and remain functional in times of distress if they exhibit mental toughness traits (Clough et al., 2002), and thus carefully evaluate what is happening to them. Mental toughness has also been shown to have a beneficial effect on students' academic performance, interpersonal relationships, and overall academic success (St Clair-Thompson et al., 2015; Stock et al., 2018). However, research on the application of mental toughness in health and academic settings is scarce. Two general hypotheses are put forward: (a) online health information seeking behavior, mental

toughness and thriving quotient are positively related (b) mental toughness has a mediating role between online health information seeking behavior and thriving quotient.

Methods

Research Design

This study is primarily quantitative in nature, and it makes extensive use of a mediational design, which seeks to explain ‘how’ or ‘why’ an effect occurs (Figgou & Pavlopoulos, 2015). Additionally, a descriptive-correlational design was used to determine the relationship between the variables that was sought after.

Population and Sampling Technique

The participants were university students enrolled in higher educational institutions in the Philippines between the ages of 18 and 35 during the academic year 2020-2021. There were 146 males and 667 females who took part in the study ($n=830$). The participants were selected from public and private universities in the Philippines in order to ensure a representative sample of respondents from across the country. According to the Sage Handbook of Online Research Methods (Fielding et al., 2016; Fricker, 2016), a non-probability sampling was used to incorporate the volunteer (opt in) panel, which can be conducted either online or via e-mail. Volunteer (opt-in) panels are initiated when participants choose to participate as a result of an invitation posted on a Facebook page created by the corresponding author. Respondents to the Facebook ads are redirected to a specific panel portal, which is in the form of a Google form, where they are asked to fill out the necessary information and complete the questionnaires. Responses were gathered through the use of a Google Form.

Research Instruments

In this study, questionnaires and validated research instruments were used. The instruments were validated by ten experts in psychology and research (psychology professors, assessment psychologists, test developers, social science experts). And it was ensured that these experts had at least master’s degree. Cronbach’s Alpha was used to specifically determine the internal consistency of the three research instruments, allowing us to know the applicability of the items for the study.

The Online Health-Seeking Information Behavior Scale (OHSIB) was used to assess the respondents’ online health seeking behavior. OHSIB is a unidimensional self-report survey designed to assess the acceptability of college students’ online health information seeking behavior. It is scored on a 5-point scale (ranging from 1 to 5). In terms of OHSIB’s psychometric property, Cronbach’s alpha revealed a good internal consistency ($r=.70$). OHSIB 12 items (e.g. *the health information I find online helps me to practice positive health habits, I search over the internet for health information because I know it can prevent what could go wrong about my health*) are all based on a systematic review of literatures that demonstrate coping with a bad health situation, involvement in medical decision making, and preventive health behaviors (Chu et al., 2017b; Nangsangna & Da-Costa Vroom, 2019; Shehata, 2020; Singh et al., 2016).

In addition, the Mental Toughness Questionnaire (MTQ-18) was used to assess students’ mental toughness. The original MTQ-18 items were used, but they were all modified based on

the characteristics of the participants (Dagnall et al., 2019). In terms of the modified mental toughness questionnaire's psychometric properties, the results revealed that it has good internal consistency for all components such as control (e.g. *I remain calm even when under great pressure*) ($r=.71$), commitment (e.g. *I remain interested for the tasks I have to do*) ($r=.71$), challenge (e.g. *I can handle well with any problem that occurs in my life*) ($r=.81$), and confidence (i.e. *I speak my mind when I have something to say in online class*) ($r=.70$).

Finally, Schreiner's original Thriving Quotient (TQ) instrument was used to understand student thriving (Schreiner, 2015). All items were used, but they were modified based on the characteristics of the participants. This metric employs a 5-point Likert-type scale. The psychometric properties revealed high internal consistency for engaged learning with five items (e.g. *I feel energized by the ideas I am learning in most of my online classes*) ($r=0.82$), academic determination (e.g. *I find a way to keep working on my assignments until they are done well*) with six items ($r=0.87$), positive perspective with five items (e.g. *I am positive about my future*) ($r=0.76$), diverse citizenship with six items (e.g. *I spend time making a difference in other people's lives*) ($r=0.76$), and social connectedness (e.g. *I feel content with the kinds of friendships I have despite our distance from each other*).

Ethical Considerations

In accordance with ethical standards, all processes and activities associated with this study have received approval from authors' institution, which has issued an approved certificate. Furthermore, as mandated by Republic Act 10173 or the Data Privacy Act of 2012 of the Republic of the Philippines, the students' personal information is protected.

Data Analysis

The mean, standard deviation, and relationship between online health information seeking behavior, mental toughness, and Thriving Quotient were calculated using descriptive-correlational analyses performed on the constructs using IBM SPSS v26.0. Additionally, a mediation analysis using the partial least squares (PLS) path modeling method was performed in SmartPLS.

Limitations

This study restricted its coverage to first-year to fifth-year College students only enrolled in private and public higher educational institutions that used an online flexible learning approach during the academic year 2020-2021 in randomly selected locations in Luzon, Visayas, and Mindanao. Men's underrepresentation in the current study is also a constraint. Another limitation is a bias that could be explained by the fact that the questionnaires were administered online, and most college students had internet access.

Results

Demographic Analysis

There were a total of 884 responses to the survey. 830 responses were used for statistical analysis after the data was analyzed. 54 responses were discarded because there were more than ten missing items in the answered questionnaires. Table 1 depicts the projected demographic characteristics of the respondents based on their answers. Eighty-two percent

(n=146) of the 830 respondents were male, compared to 18 percent (n=667) of the female respondents. 61 percent (n=495) came from private higher educational institutions, while 39 percent (n=318) came from public higher educational institutions in the Philippines, according to the type of school they attended. All of the students who participated in this study were enrolled in a university that utilized an online, flexible learning strategy.

Table 1

Results by Students' Gender and Academic Year Level

Sociodemographics		N	%
Gender	Male	146	18%
	Female	667	82%
Type of School	Private	495	61%
	Public	318	39%

Descriptive Results

As shown in Table 2, majority of the participants' online health information seeking behavior was deemed to be high, implying that their online health searches were conducted solely for preventive health purposes. This indicates that they accessed health information only from reputable and trustworthy websites and relied on medical doctors' advice rather than conducting their own online research. Additionally, typical college students exhibited moderate levels of mental toughness traits such as control, commitment, challenge, and confidence. Finally, descriptive analysis revealed that most students lacked engaged learning, academic determination, and social connectedness, but possessed a more positive outlook and diverse citizenship.

Table 2

Descriptive Results of Students' COVID-19 Related Anxiety, Mental Toughness and Thriving Quotient

Variables	Total		
	<i>x</i>	<i>sd</i>	Verbal Interpretation
Online Health Information Seeking Behavior	3.70	0.49	High
Mental Toughness			
Control	2.52	0.76	Moderate
Commitment	2.80	0.55	Moderate
Challenge	3.29	0.93	Moderate
Confidence	2.58	0.62	Moderate
Thriving Quotient			
Engaged Learning	2.97	0.73	Moderate
Academic Determination	3.42	0.86	Moderate
Positive Perspective	3.80	1.11	High
Social Connectedness	3.15	0.86	Moderate
Diverse Citizenship	3.97	0.97	High

Relationship Between Online Health Information Seeking (OHSIB) and Mental Toughness (MT)

As demonstrated in Table 3, OHSIB is positively correlated with all MT dimensions, including control ($r=0.23$, $p=.00$), commitment ($r=0.25$, $p=.00$), challenge ($r=.28$, $p=.00$), and confidence ($r=0.12$, $p=.00$). The findings indicate that the higher the level of OHSIB, the better the participants' MT. As a result of this finding, it can be deduced that browsing the internet for information about their health and then clarifying this information with medical professionals demonstrates mental toughness as well.

Table 3

Correlation analysis Between OHSIB and Mental Toughness Dimensions

	Mental Toughness (MT)				
	Control	Commitment	Challenge	Confidence	Mental Toughness
	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>
OHSIB	0.23**	0.25**	0.28**	0.12**	0.30**

** Correlation is significant at the 0.01 level (2-tailed) * Correlation is significant at the 0.05 level (2 tailed)

Legend: + .29 and below = Low Degree, ± 0.30 and ± 0.49 = Moderate Degree, ± 0.50 and ± 1 = High Degree

Relationship between Online Health Information Seeking (OHSIB) and Thriving Quotient (TQ)

Table 4 demonstrates a positive correlation between OHSIB and dimensions of thriving quotient, with an overall correlation coefficient of 0.38 and a p-value 0.00 at the alpha.05 level of significance. This demonstrates that the frequency with which students engage in OHSIB may have a beneficial effect on their ability to thrive during the COVID-19 pandemic.

Table 4

Correlation Analysis of OHSIB and Thriving Quotient Dimension

	TQ				
	Engaged Learning	Academic Determination	Positive Perspective	Diverse Citizenship	Social Connectedness
	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>
OHSIB	0.29**	0.33**	0.30**	0.36**	0.11**

** Correlation is significant at the 0.01 level (2-tailed) * Correlation is significant at the 0.05 level (2 tailed)

Legend: + .29 and below = Low Degree, ± 0.30 and ± 0.49 = Moderate Degree, ± 0.50 and ± 1 = High Degree

Relationship between Mental Toughness (MT) and Thriving Quotient (TQ)

As shown in Table 5, mental toughness had a positive correlation with the thriving quotient in college students, with a correlation coefficient of 0.71 that was statistically significant at the alpha.05 level. This implies that a higher level of mental toughness correlates with an increase in students' thriving quotient in the event of a pandemic.

Table 5*Correlation Analysis of the Dimensions of Mental Toughness and Thriving Quotient*

	Thriving Quotient (TQ)					TQ
	Engaged Learning	Academic Determin.	Positive Perspe.	Diverse Citizen.	Social Connect.	
	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>
MT						0.71**
Control	0.38**	0.46**	0.43* *	0.33**	0.29**	
Comm.	0.47**	0.57**	0.49*	0.33*	0.20**	
Chall.	0.47**	0.62**	0.57* *	0.55**	0.26**	
Confid.	0.23**	0.32**	0.33* *	0.21**	0.20**	

**. Correlation is significant at the 0.01 level (2-tailed)

*. Correlation is significant at the 0.05 level (2 tailed)

Legend: + .29 and below = Low Degree, ± 0.30 and ± 0.49 = Moderate Degree, ± 0.50 and ± 1 = High Degree

Mediation Role of Mental Toughness on the Relationship between Online Health Information Seeking Behavior (OHSIB) and Thriving Quotient (TQ)

A mediation analysis was conducted in order to determine whether mental toughness played a mediating role in the association between online health information seeking behavior (OHSIB) and thriving quotient (TQ). The partial least squares structural equation modeling (PLS-SEM) method was used to test the path coefficients, specific indirect effects, and total effects. The findings revealed that the overall effect of OHSIB on TQ was statistically significant ($\beta=0.408$, $t=13.25$, $p=.000$). With the inclusion of the mediating variable mental toughness (MT), it was discovered that the impact of OHSIB on TQ was statistically significant ($\beta=.191$, $t=6.69$, $p=.000$). Furthermore, the indirect effect of OHSIB on TQ through MT was found to be statistically significant ($\beta=.217$, $t=11.50$, $p=.000$). Moreover, the findings indicate that the relationship between OHSIB and TQ was partially mediated by MT, indicating that OHSIB may have a direct impact on students' thriving quotient whether or not MT is present.

Table 6*Mediation Analysis of the Role of Mental Toughness Between OHSIB and TQ*

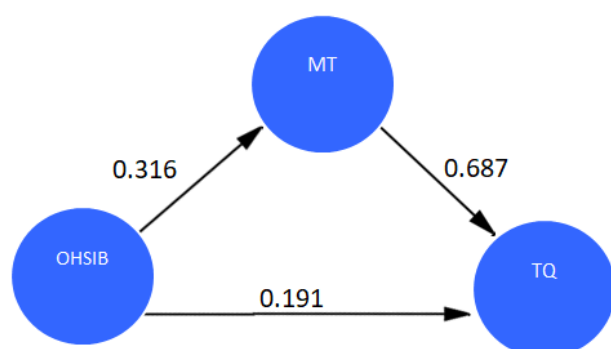
Path Name	Total Effect			Direct Effect			Indirect Effect		
	Coefficient	t	p-value	Coefficient	t	p-value	Coefficient	t	p-value
OHSIB -> MT -> TQ	0.408	13.25	.000	0.191	6.69	.000	0.217*	11.50	.000

*. Mediation effect is significant at the 0.05 level

Legend: **COV-19**=COVID-19 Related Anxiety, **OHSIB**=Online Health Information Seeking Behavior, **IU**=Intolerance of Uncertainty, **MT**=Mental Toughness, **TQ**=Thriving Quotient,

Figure 1

Mediation Model on the Mediating Role of Mental Toughness Between Online Health Information Seeking Behavior, and Thriving Quotient



The final model of the current study is depicted in Figure 1. It demonstrates that mental toughness has a partial mediating effect in the relationship between online health information seeking behavior and thriving quotient.

Discussion

The primary aim of the study is to examine the effect of mental toughness on the relationship between online health information seeking behavior and the thriving quotient of college students during a pandemic. The hypothesis that online health information seeking behavior, mental toughness, and thriving quotient were all associated was completely confirmed. Correlation analyses revealed a moderate correlation between the variables. This demonstrates the beneficial and direct effect of very good levels of online health information seeking on students' mental toughness and thriving quotient.

Recent scientific publications point in the same direction. According to previous research, following OHSIB results in an increased sense of control, improved stress and self-management, a commitment to preventive strategies, and confidence regarding their health condition (Beck et al., 2014; Bolle et al., 2015; Kyriacou & Sherratt, 2019; Linn et al., 2019). These findings indicate that OHSIB may have a beneficial effect on students' mental toughness during the COVID-19 pandemic.

The opportunity to seek face-to-face consultation for health concerns is known to be harmed by a number of barriers, including stigma, lockdown policies, and strict quarantine protocols, resulting in inefficient health care (Goyal et al., 2021; Maqbool & Khan, 2020). And online health-seeking may represent an area of support because it allows students to confidently seek assistance for their health problems without being burdened by these same help-seeking obstacles (Gulliver et al., 2010; Pretorius et al., 2019). Students were perceived to seek health information more frequently than others, which is supported by the fact that they used it as an opportunity to obtain resources to improve their lifestyles or avoid potential health concerns (Kalankesh et al., 2019). During the COVID-19 pandemic, university students frequently seek health information online (Dadaczynski et al., 2021). It is believed that their increased awareness of health concerns will result from their use of online health information. Thereby, increasing their level of health literacy (Hassan & Masoud, 2020).

Additionally, studies have established a direct and linear relationship between OHSIB and thriving quotient dimensions. For instance, according to Myrick and colleagues' study, OHSIB is positively associated with increased social connectedness and academic self-efficacy or determination (Myrick & Willoughby, 2019), implying that exercising OHSIB may have a beneficial effect on the relationships or interactions between students and their academic success. This corroborates the findings of Vamos and colleagues, who concluded that OHSIB is critical to students' academic success, affecting their level of academic determination and engagement (Vamos et al., 2020). Additionally, Kyriacou and colleagues discovered that OHSIB promotes positive life changes or perspectives (Kyriacou & Sherratt, 2019), implying that the more people exercise OHSIB, the more positive changes they will experience. The studies linking OHSIB to mental toughness and thriving quotient demonstrate the importance of online health information seeking behavior during the COVID-19 pandemic.

The second hypothesis, which examines the role of mental toughness in mediating the relationship between online health information seeking behavior and the thriving quotient, was partially confirmed. There are currently no studies examining the effect of mental toughness on the constructs under consideration. Thus, it is worth noting that the current study's findings may add to the body of knowledge regarding the specific role of mental toughness in online health information seeking and thriving during a pandemic. The current result indicates that students' online health information searches had a direct positive effect on their thriving quotient, with the exception of mental toughness. Understanding OHSIB as a significant variable in a pandemic context may help to reinforce the notion that it can have a direct effect on students' thriving quotients. Many students are isolated during the pandemic due to university closures and quarantine protocols (Zaccoletti et al., 2020), which causes them to feel anxious or distressed (Li et al., 2020; Marelli et al., 2021).

When students' OHSIB is contextualized in a pandemic context, many of them will be concerned about their current psychological functioning. According to a report, college students' mental health has deteriorated as a result of the pandemic (Galea et al., 2020; Khoshaim et al., 2020). Given that the Google search engine is capable of answering numerous questions about health and medical information every day (Strzelecki, 2020), students during the pandemic have grown accustomed to searching for information about their mental health and general well-being, with negative terms such as boredom, loneliness, worry, sadness, insomnia, depression, and suicide being the most frequently searched words (Brodeur et al., 2021; Misiak et al., 2020). Students, motivated by their desire to thrive in a troubled world, turned to online health information searches in order to maintain academic success.

Additionally, mental toughness may demonstrate its value in terms of students' online health information seeking behavior and thriving quotient. It has been suggested that online health information seeking behavior may serve as a coping mechanism for stress, ambiguity, and increased confidence regarding health concerns, as well as a means of preventing the spread of physical or mental health complications, thereby improving overall wellbeing (Oh & Song, 2017; Singh & Brown, 2014). When individuals develop mental toughness traits, they may develop a greater awareness of the negative consequences of their illness and complications. As a result, they are more likely to overcome their fears, act on available information, and survive the COVID-19 pandemic.

Conclusion

The current findings unequivocally establish a positive relationship between online health information seeking behavior, mental toughness and thriving quotients among university students in the Philippines. Simultaneously, mental toughness served as a partial mediator between the two constructs in the current study. Although the results indicated a partial mediation, it can be concluded that mental toughness can have a significant impact on students' online health information seeking behavior and thriving quotient, especially during the COVID-19 pandemic. As a result, it is critical to advocate for the inclusion of mental toughness in online health search that promote healthy personal growth and development. Additionally, this study demonstrates how having a healthy online information search has a direct effect on students' ability to thrive during the COVID-19 pandemic. The current findings may motivate future researchers to conduct additional research on the value of mental toughness and healthy online behavior in health and academic contexts.

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