



Searching for Mental Health Services: Search Strings and Information Acquisition

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Received: 8 March 2021 / Revised: 27 October 2021 / Accepted: 16 December 2021 / Published online: 13 January 2022
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Abstract

Based on decision sciences and information processing theories, how information is acquired is the foundation of decisions and choices subsequently made. Adapting the Active Information Search methodology, the aim for this study is to examine what information potential mental health clients look for in a service provider through their use of search strings. College students ($N=519$) from a large public university from the southwest USA (data collection from August to December 2018) were asked in an online survey to imagine themselves needing mental health services and list down the search string they would use in a search engine (e.g., Google). Content analysis indicated seven search string categories: location of nearby services, symptoms, types of services/specialty, asking for advice, questions about resources, questions about whether they have a problem, and looking for the “best.” Further, multivariate logistic analysis indicated that gender, psychological distress, perceived normativeness of utilizing mental health services, and type of medical insurance were associated with the type of search string the participant used in searching for mental health services. Understanding how individuals search for mental health services can help guide mental health practitioners in what information should be included in their websites. Further findings and implications are discussed.

Keywords Decision making · Mental health help seeking · Information acquisition · Search string

Relatively few individuals seek treatment for mental health issues relative to its prevalence (Eisenberg et al., 2011;

Hasin et al., 2005; National Institute of Mental Health, 2019; Patel et al., 2010; Terlizzi & Zablotsky, 2019). One way to address the need versus utilization gap is to understand how potential clients search for mental health services. Moreover, given the ubiquity of the internet, particularly in developed countries such as the USA (Pew Research Center, 2019), it is imperative to examine how potential clients use search engines such as Google to find mental health services. Using the active information search model (AIS; Huber et al., 1997, 2011, 2019), the first aim for this paper is to examine the information acquisition processes in searching for mental health services through an individual’s use of search strings in a search engine. Search strings, as used in this paper, are keywords and Boolean operators (AND, OR, and NOT) entered into a search engine’s search box to view the relevant webpages (Lewandowski & Sunkler, 2013). Search engines are defined as web-based tools that help users find relevant information in the World Wide Web (Jansen & Molina, 2006). The second aim for this paper is to identify individual characteristics associated with the type of search string generated.

Significance of Scholarship to the Public: Given the increase in mental health problems coupled with the underutilization of mental health services, it is important to examine how potential clients search for mental health services. This study found that potential clients predominantly search for information associated with geographical location of available services, information about psychological symptoms, and information about the specific type of treatment. By identifying search strings that college students use in search engines, this study helps counselors identify what information to include on their websites to reduce the need versus utilization gap in counseling and mental health services.

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Decision Making, Information Acquisition, and the Active Information Search Model

In decision sciences, the concept of *bounded rationality* suggests that decision-makers are restricted in their decision-making process due to cognitive limitations, time constraints, and lack of information (Gigerenzer, 2004). Since decision-makers have limited information and their cognitive ability to process information is also limited, cognitive shortcuts or heuristics are employed to help facilitate the decision process. Within the information processing (Fiske & Taylor, 2013) and process-oriented decision-making paradigms, information acquisition plays a crucial role in making decisions. That is, the manner of seeking information (whether it is thorough or quick and heuristically driven) and the subsequent information acquired are essential to understanding how decisions are made.

Acknowledging the importance of information acquisition in decision-making (Huber et al., 2011, 2019), this paper examined how individuals search for information related to choosing a mental health professional or counseling service. As such, this paper is situated under the larger theoretical umbrella of process-oriented decision-making. The process-oriented decision-making paradigm was also the foundation for Huber et al.'s (1997) classic Active Information Search (AIS) study, where participants are given a more active role in seeking out information rather than being presented all the relevant information. In brief, participants in an AIS experiment are presented with a quasi-realistic task (e.g., purchase a car; Williamson et al., 2000) and can ask as many questions from the experimenter as they need to accomplish the task. Other studies have since made revisions to the original AIS experiment (e.g., using a web-based interface, Schulte-Mecklenbeck & Neun, 2005; providing verbal rather than written information, Williamson et al., 2000), but the core components of having a decision task, having the participants seek out the relevant information needed to accomplish the task (information acquisition phase), and making a decision (decision phase) have remained.

Using the AIS as a theoretical and methodological scaffold, this study aimed to study information acquisition regarding potential mental health service providers by examining what search strings were used in a hypothetical search task. In brief, participants in this study were instructed to imagine themselves needing mental health services and asked to search for a mental health provider using a search engine such as Google or Bing. In this study, asking participants to submit search string queries to the search engine was analogous to the AIS information acquisition phase. Consistent with the AIS rationale,

the topics related to the questions asked were presumed to be important for the decision-maker, and the information gathered were presumed to be used in the decision process.

Search String Generation and Utilization

To our knowledge, there are no current studies that have examined the information acquisition associated with searching and choosing a mental health provider. However, a related body of work exists for seeking medical and mental health information on the Internet. There has been an increasing reliance on and use of the Internet for health and mental health information (Basch et al., 2018; Graham et al., 2015; Rainie & Fox, 2000; Reavley et al., 2011; Soreni et al., 2019). In addition, those that accessed information from the Internet have a higher likelihood of going to a mental health professional or a general medical practitioner for psychological issues (Reavley et al., 2011), further highlighting the importance of this study's focus on examining search strings used on search engines when looking for mental health services.

Although the Internet is used heavily to search for medical and mental health information (e.g., Park & Kwon, 2018), some authors argue that the manner of searching is suboptimal (Eysenbach & Kohler, 2004; Hansen et al., 2003; Morahan-Martin, 2004; Rainie & Fox, 2000). On average, health information seekers only take around 6 min to retrieve answers to their questions that they feel confident about, and the number of words used by health information seekers ranged between one to four words (Buhi et al., 2009; Eysenbach & Kohler, 2004; Hansen et al., 2003). Health information seekers also rarely turned to the second page and would usually only access the links for the first 10 search results (Hansen et al., 2003). Furthermore, only a quarter of Internet health information seekers are vigilant and would verify a website's information (Rainie & Fox, 2000). The suboptimal way of searching health-related information over the Internet emphasizes the need to examine how potential clients search for mental health services, particularly what search strings are typically used. Understanding what search strings are used can help mental health professionals understand what information is used and prioritized in the decision processes involved in choosing a mental health services.

Predictors of Search String Generation and Use

The second aim for this paper is to explore which individual-level attributes are associated with the generation or use of a particular search string category. To the authors' knowledge,

there are no previous studies that examined how individuals generate search strings for mental health services, much less the predictors of these search strings. As such, the choice of predictor variables for this study is selected from the mental health help-seeking and health information search literature.

The mental health help-seeking literature can help elucidate potential predictors of categories of search strings. For example, females hold more positive attitudes towards mental health help-seeking and are more likely to utilize professional mental health services compared to their male counterparts (Addis & Mahalik, 2003; Nam et al., 2010). Other studies suggested that subjective normative beliefs associated with mental health help-seeking (i.e., subjective beliefs that other individuals or groups think the person should engage in a particular behavior, in this case to seek counseling) were associated with willingness to see a counselor (e.g., Kim & Park, 2009). Other studies indicate that positive attitudes towards help-seeking and severity of problem were positively associated with willingness to seek mental health services (e.g., Tulião & Holyoak, 2020; Tulião et al., 2016); whereas social and personal stigma associated with seeking mental health services (e.g., Tulião & Holyoak, 2020), exorbitant costs and lack of medical insurance covering mental health services (Rowan et al., 2013) are often-cited barriers to treatment utilization. Those who had past help-seeking experience were also more likely to report seeking mental health services in the future (Ciarrochi & Deane, 2001). Finally, motivated by the need to reduce symptoms and negative affect, those with higher psychological distress are more willing to seek counseling (e.g., Tulião et al., 2016).

The literature on health information search and client preferences indicate that client characteristics are associated with certain information search behavior or preferences. For instance, those with higher psychological distress and females were more likely to seek mental health information using the Internet (Reavley et al., 2011), findings that parallel the results of the mental health help-seeking literature. Taking the mental health help-seeking literature and health information search literature together, it is viable to posit that gender, subjective normative beliefs, attitudes, problem severity, stigma, prior experience, and medical insurance status could impact search string generation when searching for mental health services.

Present Study

College students who need psychological services do not necessarily seek nor access treatment (Eisenberg et al., 2011). One way to close the need versus utilization gap is to examine the process of information acquisition involved in choosing a mental health service provider. In this exploratory study, we argue

that information acquisition is an essential first step in decision-making (Fiske & Taylor, 2013), and understanding what information is gathered elucidates the decision processes underlying choices for a counselor. Adapting some components of the AIS methodology, the first aim for this study was to understand information acquisition by examining the search strings used in a search engine when tasked to look for a mental health service provider. Other than information acquisition and decisional processes, the need to study what search strings are utilized is of significance given that the Internet is frequently used to search for health-related information (Rainie & Fox, 2000; Ybarra & Suman, 2006) and that individuals use limited search strategies when searching for health-related information (Morahan-Martin, 2004). For the first aim, the goal was to identify categories of search strings through qualitative content analysis.

The second aim for this study was to identify possible predictors of search string category use. Due to the nascency of this topic and the exploratory nature of this study, we cannot outline specific hypotheses that were tested. However, based on the health information search, client preference, and help-seeking literature, we identified gender, subjective normative beliefs related to seeking psychological help, attitudes and stigma towards seeking mental health services, prior experience with receiving mental health services, and having medical insurance as possible correlates of a specific search string category utilization.

Methods

Participants

Research protocols were examined and approved by Texas Tech University Institutional Review Board prior to participant recruitment. Data for this study was part of a larger study on college student help-seeking behavior and was advertised as such to an undergraduate student subject pool (SONA system) at a large public university in the southwest USA. The larger study focused more on college students' mental health and substance use help-seeking behaviors and intent (Tulião & Holyoak, 2020; Tulião et al., 2019). There are no substantial overlaps between prior published studies and this study.

The SONA system is open to all undergraduate students across all majors. Though this particular demographic information was not obtained from participants, our study was open to a larger demographic of students with multiple majors and fields of study included into the pool. A total of 1099 students participated in the online survey (using Qualtrics.com), signed an online informed consent form, and received course credits for participation. Data collection was conducted from April to December 2018. Participants could not complete the online survey using mobile/smartphones.

To evaluate random, careless, or insufficient effort responding (Curran, 2016), four validity items (e.g., “If you are paying attention to this survey, choose ‘moderately agree’”) were randomly embedded among the questions in the survey. Following Curran’s (2016) suggestions, those with more than 50% incorrect answers in the validity test ($n = 308$) were excluded. Of the 791 participants retained after the validity test exclusion procedures, another 272 participants declined to answer the mental health professional search task (see Search Task below), which leaves a total of 519 participants retained for subsequent analyses.

Of the 519 participants ($m_{\text{age}} = 20.84$, $sd = 2.67$; females = 390, 75%), majority self-identified as White/European American ($n = 367$, 71%), followed by Latinx ($n = 83$, 16%), African American ($n = 26$, 5%), biracial ($n = 20$, 4%), and Asian American ($n = 13$, 3%). Participants were predominantly in their senior ($n = 186$, 36%) and junior year ($n = 150$, 29%), followed by sophomores ($n = 100$, 19%) and first-years ($n = 83$, 16%).

Search Task Procedure

The search task used in this study was embedded in a larger online survey on college student help-seeking behavior. On a separate survey page, participants were presented with the following instructions:

Imagine that you are at the point wherein you think you need to seek help from a mental health professional (e.g., psychologist, psychiatrist, counselor, etc.) for a psychological problem you are having. Imagine also that you are on Google, Bing, or other web search program, and you are searching for information related to your need to seek mental health help services. On the space below, write down the questions or the search words you will use to search for such information. Separate your questions and search terms using a semi-colon (;). Write “N/A” if you refuse to answer this question.

Below the instructions was a text box where participants can answer the question.

Measures

To review, the second aim for this study was to identify which person characteristics or variables are associated with the use of a specific search string. The measurements enumerated here reflect these hypothesized correlated variables.

Demographic Variables The demographic variables used in this study include gender (0 = males, 1 = females) and prior experience with receiving mental health services. For prior experience, participants were asked “Have you ever sought

help from a mental health professional before (e.g., counselor, psychologist, psychiatrist, social worker)?” and was coded “0” for “No” and “1” for “Yes.”

Medical Insurance Information Participants were asked if they currently have medical insurance, where they could report “Yes” or “No”. If they reported “No,” they proceeded with the online survey. If they reported “Yes,” another question was asked: “does your medical insurance cover mental health services (e.g., counseling)?” Participants had the option of reporting “Yes,” “No,” and “I don’t know.” Given this information, we created four groups for the medical insurance information: (1) those that have medical insurance and know that their medical insurance includes mental health services (Reference group), (2) those without medical insurance, (3) those with medical insurance but without mental health services, and (4) those with medical insurance but do not know if their medical insurance covers mental health services. Our choice of Reference group is based on an assumption that individuals with medical insurance and know that mental health services are covered have easier access and better knowledge about the mental health services available to them compared to the other groups. In other words, this manner of dummy coding can help evaluate whether the groups with potential “deficiencies” (either because they lack access to mental health services or they lack knowledge about the services available to them) are significantly different from a group that presumably have better access and knowledge.

Subjective Normative Beliefs of Seeking Professional Help Three items from the General Help-Seeking Questionnaire (GHSQ; Wilson et al., 2005) were selected and adapted for this study to measure perceived normative beliefs related to seeking help from mental health professionals. The original GHSQ included both formal (e.g., counselors and psychologists) and informal sources of help (e.g., friends, parents, and partners). Because the focus of this study is on the normativeness of seeking *professional* (formal) help, three groups of mental health professionals were retained and constituted the three items for this measure: (1) doctors; (2) professional counselor, psychologist, psychiatrist, or social worker; and (3) phone helpline, phone counselor, and online counselor. Participants were presented with a statement “In your community and/or among people you know, how frequently do they consult these people for psychological problems?” Participants rated the frequency that people they know or in their community seek help from mental health professionals using a Likert scale ranging from 1 (*Never*) to 5 (*Always*). Reported Cronbach’s alpha ranged from 0.70 to 0.85, and 3-week test–retest reliability estimates ranged from 0.86 to 0.92 in a sample of Australian adolescents (Wilson et al., 2005). Cronbach’s alpha for the

current sample was 0.76. The sum of the scores was utilized in subsequent analyses, and higher scores indicate a perception that seeking mental health services is more normative.

Attitudes Toward Seeking Professional Psychological Help—Short Form The 10-item ASPPH (Fischer & Farina, 1995) is a unidimensional measure of attitudes towards seeking professional psychological help. Sample items include “If I were experiencing serious emotional crisis, I would be sure that psychotherapy would be useful” and “People should solve their own problems, therefore, getting psychological counseling would be their last resort.” Participants are asked to report their agreement to each item using a Likert scale ranging from 0 (*Disagree*) to 3 (*Agree*). Previously reported coefficient alpha scores in a college student sample ranged from 0.82 to 0.84 (Fischer & Farina, 1995) and 0.80 with participants in the current study. Recent psychometric evaluation of the ASPPH indicated good reliability (coefficient alpha of 0.77 for college students and 0.78 for medical patient samples) and significant associations with subsequent use of mental healthcare (Elhai et al., 2008). Sum of scores were used in subsequent analyses, and higher scores reflect more positive attitudes about seeking psychological help.

Stigma Scale for Receiving Psychological Help The SSRPH (Komiya et al., 2000) is a 5-item instrument that measures perception about how stigmatizing it is to receive psychological treatments. Participants rated their agreement to each item using a Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Sample item include “Seeing a psychologist for emotional or interpersonal problems carries a social stigma.” Coefficient alpha in a college student sample previously reported was 0.72 (Komiya et al., 2000), and 0.83 for participants in this study. The SSRPH was found to have adequate item-total correlations ($r_s = 0.35$ to 0.64), a unidimensional factor structure with standardized factor loadings ranging from 0.40 to 0.81, and a significant negative correlation with attitudes towards help-seeking and emotional openness (Komiya et al., 2000). Sum of scores were used in subsequent analyses, and higher scores reflect higher stigma about receiving mental health services.

Depression, Anxiety, and Stress Scale Psychological distress was operationalized and measured using the DASS short form (Lovibond & Lovibond, 1995). The 21-item instrument was originally conceptualized to measure Depression, Anxiety, and Stress; however, recent psychometric evaluation of the DASS indicated that having a general factor, Psychological Distress, along with orthogonal factor Depression, Anxiety, and Stress, had a better model fit compared to a three-factor solution (Henry & Crawford, 2005). These results lend support to using the DASS aggregated score to

measure psychological distress. Participants were asked to report the frequency of symptoms over the past week using a Likert scale ranging from 0 (“Did not apply to me at all”) to 3 (“Applied to me very much, or most of the time”). Sample items include “I felt down-hearted and blue” (Depression), “I was worried about situations in which I might panic and make a fool of myself” (Anxiety), and “I found it difficult to relax” (Stress). Henry and Crawford’s (2005) reported coefficient alpha was 0.93 for the aggregated summed score (non-clinical, UK community sample), and 0.96 for the current study’s sample. Recent psychometric research on the 21 item DASS suggested that the measure was significantly associated with other measures of stress, self-esteem, anxiety, and negative affect (Lee et al., 2019; Korean sample recruited from health and mental health community centers). Lee et al. (2019) also reported a Cronbach’s alpha of 0.93 for the 21-item DASS. Sum of scores were used in subsequent analyses, and higher DASS scores indicate higher psychological distress.

Data Analysis

Aim 1: Qualitative Data Analysis This study utilized a directed content analysis to identify, group, and categorize codes and patterns within the search string data collected (Elo & Kyngäs, 2008; Hsieh & Shannon, 2005). Directed content analysis seeks to validate and build on an existing theory through promoting rich and detailed descriptions of a phenomenon. It can also provide guidance about the variables of interest, thus leading researchers to developing the initial coding scheme. The AIS model was utilized by the researchers to identify key variables as the initial coding categories. The first 100 search string entries were evaluated using the AIS model by two members of the team (AT and NM), and nine thematic codes were developed. Following the steps outlined by Hsieh and Shannon (2005), research team members AT, NM, and DH developed the operational definitions for each category using the AIS model. Utilizing these nine thematic codes and operational definitions, research team members MG and AI, and research assistant KW individually coded all 1248 search strings, under the supervision of and in constant discussion with research team member AT. Interrater reliability among MG, AI, and KW was $\kappa = 0.93$ (with $\kappa > 0.80$ suggesting strong agreement among raters, and 80% agreement as a minimum interrater agreement; McHugh, 2012). Additionally, in cases where there were disagreements in coding, author LH resolved the differences. Then, these codes were discussed collectively, and all research team members agreed that the *type of profession* code and *specialty* code should be combined to represent one overall thematic code. At the end of this process, seven categories emerged: *location*, *symptom*, *type of profession/specialty*, *advice*, *resources*, *do I have a problem*, *best*, and *irrelevant*.

Although the researchers did not conduct any interviews or have face-to-face contact with the participants, it is still important to consider researcher reflexivity (Charmaz, 2006). Discussions regarding subjectivity and bias were frequently held amongst research team members during the development of the project, as well as during coding and interpretation to ensure data was accurately depicted. The research team included three undergraduate students, three graduate students, and one assistant professor. Cultural identities of the research team include White ($n=3$), African-American ($n=1$), Hispanic ($n=1$), Filipino ($n=1$), and multiracial ($n=1$). Three of the researchers are marriage and family therapists, and one is a clinical psychologist by training.

Aim 2: Quantitative Data Analysis To review, the task in this study required each participant to list search strings they would use to search for a mental health professional, and they had the option of reporting multiple search strings. That meant that each participant could provide search strings that could fall on different search string categories (as derived from the qualitative analysis). As such, each participant can either have used or not used a particular search string category. A multivariate logistic regression (i.e., logistic regression with multiple criterion variables, analogous to a MANCOVA) was utilized to examine the factors associated with usage of a particular category of search strings. The criterion variables in the study were the categories derived from the qualitative analysis (seven criterion variables in total, see the “Results” section), and each participant either used (coded as “1”) or did not use (coded as “0”) the search string category. Predictor variables (gender, subjective normative beliefs, attitudes towards seeking psychological help, stigma towards seeking psychological help, prior experience with mental health services, and medical insurance status) were entered simultaneously into the multivariate logistic regression model.

To interpret, a statistically significant ($p < 0.05$ based on Wald’s test t) and positive unstandardized b coefficient corresponds to the increase in the likelihood of using a specific search string (which comes from the qualitative analysis) to search for mental health providers, in log-odds unit, per one unit increase in the predictor variable (a negative b corresponds to a decrease). For the odds ratio (OR; the logistic regression analogue to standardized coefficient β in multiple regression), $OR > 1$ indicates a positive relationship between the predictor and criterion variables, whereas $OR < 1$ indicates a negative relationship. OR reflects the increase in odds of using a specific search string for one-unit increase in the predictor variable.

Mplus version 8 (Muthén & Muthén, 2017) was used to analyze the data, and full-information maximum likelihood

was used to account for missing data (Enders, 2010). Maximum likelihood with robust standard errors (MLR) was the estimator utilized. Because of the use of MLR, model comparisons were performed using a likelihood ratio test with scaling correction factor ($-2\Delta LL_{MLR}$; Satorra, 2000). Although a SEM software was used for the multivariate logistic regression model, model fit indices are unavailable in this case because the model is just-identified, and conventional model fit statistics (e.g., CFI and TLI) are unavailable when analyzing generalized models.

Results

Aim 1: Categories of Search Strings Used Based on Qualitative Data Analysis

Results of the content analysis of the search strings to search for a mental health professional suggested seven broad categories. It is important to note that some participants provided responses which could be coded and included in multiple categories. It was decided that participant’s initial response would be used as the primary code.

Location The first search string category, *Location*, was used by 40% ($n=206$) of the participants. *Location* category involved search strings that pertain to location of the mental health professional or proximity of available services to the participant. Sample search string entries in this category include “psychological services near me”; “anxiety psychologist in Lubbock, TX (city and state of the university where the study was conducted)”; and “psychologists in my area.”

Symptom The second search string category, *Symptom*, was used by 26% ($n=135$) of the participants. *Symptom* category involved search strings that queries about specific symptoms experienced (e.g., “panic attacks” and “depression”) or how a psychological illness is manifested (e.g., “what does depression look like?”).

Type of Profession/Specialty The third search string category, *Type of Profession/Specialty*, was used by 24% ($n=122$) of the participants. *Type of Profession / Specialty* category included search strings pertaining to the type of mental health professional (e.g., “psychiatrist,” “college therapist,” “psychologist,” and “mental health counselor”), particular theoretical/religious leanings (e.g., “Christian counseling services”), or specific interventions being utilized (e.g., “EMDR therapist” and “DBT”).

Advice The fourth search category, *Advice*, was used by 23% ($n=121$) of the participants. *Advice* category included search strings asking for specific advice on how to cope or

deal with a psychological issue experienced (e.g., “how to control your drinking?,” “how to deal with a parent’s death,” and “how to break out of loneliness?”).

Resources The fifth search string category, *Resources*, was used by 18% ($n=92$) of the participants. *Resources* category included search strings that queries about cost-related information (e.g., “where can I get free counseling?,” “how much will it cost?,” and “does my insurance cover therapy sessions?”) or resources, whether there are free services available (e.g., “does Texas Tech University have free counseling?”).

Do I Have a Problem? The sixth search string category, *Do I Have a Problem?*, was used by 6% ($n=33$) of the participants. *Do I Have a Problem?* category included search strings that asks questions whether one is suffering from a specific mental illness (e.g., “am I bulimic?” and “am I an alcoholic?”), whether the symptom experienced is “normal” (e.g., “is anxiety normal?”), or when it is appropriate to seek help (e.g., “how do I know I should see a health professional?”).

Best The seventh search category, *Best*, was used by 6% ($n=32$) of the participants. *Best* category included queries regarding who offers the best services in the area (e.g., “best counseling specializing in mental health services” and “top rate counselors in ‘area’”) or queries for reviews of mental health professionals (e.g., “list reviews of mental health professionals in my area”).

On average, participants provided 2.40 ($sd=1.62$, $mdn=2.00$; range 1 to 15) search strings across the seven categories. In decision-making process tracing literature, the first few pieces of information hold an important place in making decisions. The information sought for first is presumed to be the information that the decision-maker finds important to the decision. Based on these presumptions, the majority of the participants found *Location* ($n=170$, 33%)

as the most important element in their decision-making process in seeking a mental health professional, followed by *Symptom* ($n=90$, 17%), *Type of Profession/Specialty* ($n=84$, 16%), *Advice* ($n=58$, 11%), *Resources* ($n=36$, 7%), *Do I Have a Problem?* ($n=16$, 3%), and *Best* ($n=15$, 3%). Of the 519 participants in this study, 276 (53%) provided a second search string. Of those that provided a second search string, majority used search strings in the *Symptom* category ($n=60$, 22%), followed by *Location* ($n=51$, 18%), *Advice* ($n=43$, 16%), *Type of Profession/Specialty* ($n=39$, 14%), *Resources* ($n=38$, 14%), *Do I Have a Problem?* ($n=11$, 4%), and *Best* ($n=10$, 4%).

Descriptive Statistics, Bivariate Correlations, and Assumptions for Data Analysis

The second aim for this paper was to examine how a specific search string category is associated with various demographic, mental health help-seeking variables, and psychological distress. Table 1 presents the descriptive statistics and bivariate correlations among gender, subjective normative beliefs associated with seeking psychological services (normativeness), attitudes towards seeking mental health services (attitudes), stigma towards seeking psychological help (stigma), psychological distress, and prior experience of utilizing counseling or other mental health services (prior experience). To examine the relationship between medical insurance status and other predictor variables, a between-groups ANOVA was performed (see Table 2). Results of the ANOVA and pairwise comparisons using Tukey HSD suggest that those with medical insurance who know they have mental health coverage had significantly higher normativeness and more positive attitudes about seeking mental health services compared to those with medical insurance who were unaware they have mental health coverage. On the other hand, those without medical insurance reported significantly higher psychological distress compared to those with medical insurance who are unaware they have mental health coverage.

Table 1 Descriptive statistics and bivariate correlations ($N=519$)

	1	2	3	4	5	<i>M</i>	<i>sd</i>	<i>n</i>	%
1 Female	1							390	75%
2 Normativeness	.06	1				5.57	2.68		
3 Attitudes	.13**	.31**	1			18.40	5.69		
4 Stigma	-.07	-.10*	-.26**	1		12.89	4.63		
5 Psychological distress	.08	.17**	.02	.24**	1	16.53	15.73		
6 Prior experience	.14**	.27**	.33**	.03	.34**			251	48%

Normativeness=perceived subjective normative beliefs associated with seeking psychological services from mental health professionals; Attitudes=attitudes towards seeking psychological help; Stigma=stigma towards seeking psychological help; Prior Experience=have previously sought counseling or other mental health services

* $p < .05$; ** $p < .01$

Table 2 Medical insurance status group comparisons

	Medical Insurance + Mental Health Coverage (n = 147)			No Medical Insurance (n = 40)			Medical Insurance + No Mental Health Coverage (n = 28)			Medical Insurance + Unaware if there is Mental Health Coverage (n = 294)			F	χ^2		
	M	SD	%	M	SD	%	M	SD	%	M	SD	%				
Gender																
Females			116			79			30		75			214		73
Males			31			21			10		25			80		27
Normativeness	6.20a	2.73		5.89	3.25		6.29	2.89					5.14a	2.45		6.27*
Attitudes	20.41a	5.95		18.43	6.03		18.42	5.62					17.42a	5.31		9.29*
Stigma	12.47	4.8		12.88	5.06		14.90	4.5					12.92	4.5		2.15
Psychological distress	17.92	17.34		21.85a	18.49		22.07	16.18					14.60a	14.08		4.60*
Prior experience																
Yes			100			68			17		43			108		37
No			47			32			23		57			186		63
																51.98*

Those that share letters are significantly different at $p < .05$ based on ANOVA pairwise comparison using Tukey's HSD

* $p < .01$

Missing data analyses for the predictor variables indicated that the missing data patterns can be assumed to be missing completely at random (Little's MCAR $\chi^2 = 28.98$, $df = 33$, $p = 0.67$). The percent of missing data for each predictor variable ranged from 1% (psychological distress) to 2% (medical insurance status). Mahalanobis' distance for all cases was greater than 0.001, indicating the absence of multivariate outliers. Univariate skewness and kurtosis estimate for all continuous variables except for psychological distress were less than 111. Psychological distress had a skewness estimate of 1.02, suggesting a positively skewed distribution. However, because psychological distress is treated as a predictor in the analysis and that a positively skewed distribution is expected in a non-clinical sample, no data transformation was deemed necessary. With a sample size of 519 and nine predictor variables (accounting for the dummy coding for medical insurance status), the number of participants in this study exceeds the recommended minimum of 10 cases per predictor variable in logistic regression (van der Ploeg et al., 2014).

Aim 2: Correlates of Search Strings Categories Based on Quantitative Data Analysis

Results of the loglikelihood ratio test with correction factors suggested that the multivariate logistic regression model was significantly better compared to an intercept-only model ($-2\Delta LL_{MLR} = 595.06$, $\Delta df = 99$, $p < 0.001$). Results of the multivariate logistic regression (see Table 3) indicated that females are more likely to use a *Location* ($b = 0.51$, $p < 0.05$, OR = 1.66) and *Resources* ($b = 0.64$, $p < 0.05$, OR = 1.88) search string compared to males. Individuals who perceive that mental health help-seeking from a professional is more normative are more likely to use a search string based on *Symptoms* ($b = 0.10$, $p < 0.01$, OR = 1.11), whereas attitudes about seeking psychological services was not associated with any search string category. Participants who have higher stigma towards seeking mental health services are more likely to use *Resources*-related search strings ($b = 0.09$, $p < 0.01$, OR = 1.10). Individuals with higher psychological distress are more likely to use *Symptom*- ($b = 0.02$, $p < 0.01$, OR = 1.02) and *Advice*-based search string ($b = 0.02$, $p < 0.05$, OR = 1.02), but are less likely to use *Resources*-based search strings ($b = -0.02$, $p < 0.05$, OR = 0.98). Prior experience in working with a mental health professional was not associated with any type of search string category. Compared to individuals with medical insurance and knows they have mental health coverage, individuals who have medical insurance but unaware if their insurance covers mental health services are more likely to use search strings under the *Do I Have a Problem?* category ($b = 1.54$, $p < 0.05$, OR = 4.66), but less likely to use search strings under the *Best* category ($b = -0.82$, $p < 0.05$, OR = 0.44).

All possible pairwise comparisons across medical insurance groups were performed. Results indicated that aside from what was mentioned, no other significant medical insurance group differences were observed. MacFadden Pseudo- R^2 for all the criterion binary variables were low (see Table 3).

Discussion

The aims of this study were (a) to understand information acquisition among college students by examining the search strings used in a search engine when tasked to look for a mental health service provider and (b) to identify possible predictors of search string category use. Using both qualitative content analysis and multivariate logistic regression, we identified categories of search strings used by participants and the correlates of these search string categories. Using AIS as a theoretical scaffold, this study is, to our knowledge, the first to examine information acquisition when potential clients search for mental health services. Results of this study indicated that there are several information pieces that individuals tend to look for, *Location* (e.g., “counselors near me”) being the most frequent search string category utilized by the participants. Consistent with previous research conducted on geographical access to health services and mental health access in rural areas (Burgess & DeFiore, 1994; Jordan et al., 2004; Schmitt et al., 2008), results of this study indicate that individuals do consider geographical location an important factor when searching for services. These findings together with the results of this study suggest that distance does not only deter individuals from accessing services, but plays a contributing role in the search process as well. Results also indicate that females are more likely to use location-based search strings compared to men, which could reflect the gender differences in utilization of psychological services (Addis & Mahalik, 2003; Nam et al., 2010). It can be argued that searching for the location of available services is reflective of a predisposing willingness to go to treatment. Hence, because females are already more likely to seek and utilize psychological services, they also tend to use search strings that are preparatory to accessing interventions.

Symptom-based search string category (e.g., “depression” and “anxiety”) was the second most used by the participants. This result indicated that, rather than searching for mental health service or professional as instructed, participants still opted to search for symptoms ailing them. From an information acquisition process perspective, this result could be reflective of a tendency to understand one’s psychological issue first (understanding the problem) before seeking for treatment (look for solutions). Consistent with other studies (Reavley et al., 2011), the psychological distress severity was associated with a symptom-based search. In the literature and models on decision-making heuristics that account

for bounded rationality (Gigerenzer, 2004), decision-makers tend to take cognitive short-cuts, and one way to simplify decision-making is to prioritize information that is most relevant and most valued by the individual. In this study’s case, the tendency to use symptom-based queries among individuals with high psychological distress is likely because they are already acquainted with, or bothered by, the symptoms and issues they are experiencing (e.g., depression and anxiety), and the cause for these symptoms are likely more salient in the list of information they wanted to acquire. The perceived normativeness of seeking mental health services was also associated with a higher likelihood of using symptom-based queries. It is viable to posit that discussion about symptoms of psychological issue are more commonplace in the social networks of those who find mental health help-seeking as more normative. Hence, utilization of symptom-based queries is also more normative and acceptable.

The third most utilized search string category, *Type of Profession/Specialty*, seem to be a catchall phrase that participants use to search for a mental health professional. To review, search queries in this category typically include terms such as “counselor,” “psychiatrist,” “psychologist,” and “therapist.” Furthermore, no variables we examined were significantly associated with this category. It is important to note too that the search strings typically used (e.g., “counselor,” “psychologist, and “psychiatrist”) were mentioned in the instructions for the search task.

The *Advice* (e.g., “how do I deal with depression?”) and *Do I Have a Problem?* (e.g., “what are the signs of a mental disorder?”) are the fourth and sixth most utilized search string, respectively; however, the two seem to share conceptual similarities with *Symptom*-based queries. From examining an information acquisition process perspective, both search string categories seem to focus more on information related to the problem (*Do I Have a Problem?*) and solution to the problem (*Advice*). Group comparisons indicated that, compared to those with medical insurance and know that mental health services are covered, individuals with medical insurance but do not know if mental health services are covered are more likely to use *Do I Have a Problem?* search query. Naivete concerning availability of mental health coverage could indicate relatively lower knowledge about mental health issues themselves; hence, they are more likely to decide on the presence or absence of a problem first before searching for treatment options. On the other hand, individuals with elevated psychological distress are more likely to use *Advice*-based search query. Similar to *Symptom*-based search, individuals who already acknowledge some psychological issues are more likely to search for solutions and treatment for the problem.

Searching for available *Resources* (e.g., “where to find free counseling?” and “how much will counseling cost?”) is the fifth most used search string query, and females are more

Table 3 Multivariate logistic regression results identifying correlates of search string categories

Predictor variables	Search string categories																							
	Location (MF-P $R^2=0.032$)			Symptom (MF-P $R^2=0.033$)			Do I have a problem? (MF-P $R^2=0.033$)			Resources (MF-P $R^2=0.033$)			Type of profession/specialty (MF-P $R^2=0.032$)			Best (MF-P $R^2=0.033$)			Advice (MF-P $R^2=0.032$)					
	<i>b</i>	<i>t</i>	OR	<i>b</i>	<i>t</i>	OR	<i>b</i>	<i>t</i>	OR	<i>b</i>	<i>t</i>	OR	<i>b</i>	<i>t</i>	OR	<i>b</i>	<i>t</i>	OR	<i>b</i>	<i>t</i>	OR	<i>b</i>	<i>t</i>	OR
Female	0.51	2.29*	1.66	-0.18	-0.76	0.84	-0.71	-1.81	0.49	1.88	2.11*	1.88	0.00	0.01	1.00	0.14	0.30	1.15	-0.29	-1.20	0.75			
Normativeness	0.03	0.88	1.03	0.10	2.65**	1.11	-0.07	-0.73	0.94	1.03	0.58	1.03	-0.01	-0.33	0.99	0.11	1.40	1.11	0.04	1.03	1.05			
Attitudes	-0.01	-0.29	1.00	-0.01	-0.67	0.99	0.02	0.58	1.02	1.05	1.70	1.05	0.01	0.21	1.01	-0.03	-0.73	0.97	0.01	0.41	1.01			
Stigma	0.02	0.82	1.02	0.01	0.28	1.01	-0.03	-0.63	0.97	1.10	3.29**	1.10	0.00	0.67	1.00	-0.03	-0.57	0.98	-0.02	-0.92	0.98			
Psychological distress	-0.01	-1.78	0.99	0.02	3.11**	1.02	0.01	0.96	1.01	0.98	-2.50*	0.98	-0.01	-1.38	0.99	-0.01	-0.92	0.99	0.02	2.42*	1.02			
Prior experience	-0.14	-0.67	0.87	0.19	0.80	1.21	-0.07	-0.14	0.94	0.94	-0.22	0.94	0.22	0.92	1.24	0.03	0.07	1.03	-0.48	-1.90	0.62			
MI; aware of MH	Reference group																							
No MI	-0.30	-0.79	0.74	-0.33	-0.74	0.72	0.82	0.82	2.27	0.71	1.60	2.03	0.14	0.34	1.16	-1.52	-1.65	0.22	0.09	0.21	1.10			
MI; No MH	0.05	0.11	1.05	-0.31	-0.57	0.74	0.65	0.56	1.92	-0.27	-0.45	0.77	0.40	0.89	1.50	-0.36	-0.43	0.70	-0.13	-0.24	0.88			
MI; unaware of MH	-0.18	-0.81	0.84	0.16	0.65	1.18	1.54	2.49*	4.66	0.03	0.12	1.03	-0.11	-0.45	0.89	-0.82	-2.03*	0.44	0.13	0.49	1.14			

Normativeness = perceived subjective normative beliefs associated with seeking psychological services from mental health professionals; Attitudes = attitudes towards seeking psychological help; stigma = stigma towards seeking psychological help; prior experience = have previously sought counseling or other mental health services; MI = Medical Insurance; MH = whether medical insurance covers mental health services

OR odds ratio, *t* Wald's test, MF-P R^2 MacFadden's pseudo R^2 estimate

* $p < .05$; ** $p < .01$

likely to use this search string category. Similar to *Location*, the gender differences observed here could be indicative of higher willingness to seek mental health services among females in general (Addis & Mahalik, 2003; Nam et al., 2010). Interestingly, individuals with higher psychological distress are less likely to use resources-based search strings. Juxtaposing this result with those in *Symptom* and *Advice*, it seems that individuals with elevated psychological distress are more interested in understanding the ailments and how to stop the symptoms rather than looking for tangible steps to alleviate the problem. Although still a subject for future research, it would be interesting to examine if such reluctance to look for concrete steps to alleviate the psychological problem also exacerbates the issue. Another interesting result is that individuals with elevated stigma towards receiving psychological services are more likely to use *resources*-based search strings. Stigma, in general, is associated with lower intent to seek treatment (Clement et al., 2015). Results of this study could indicate that, when “forced” to look for mental health services (as instructed in the search task), individuals with elevated stigma towards seeking services are more likely to focus on solutions to potential barriers such as cost, rather than trying to understand the psychological issue or its treatment.

Implications

To close the gap between prevalence of psychological problems and utilization of mental health services, this study emphasizes the need to understand a potential client’s information acquisition and decision processes. One significant implication of the results is the need to make searching for mental health services less cognitively taxing. Thus, clinicians should make every effort to account for, consider, and reduce cognitive load that decision-makers often face when searching for mental health services.

Historically, mental health services have relied on in-person, face-to-face contact when treating mental health disorders (Wade et al., 2014). Our findings indicated that *location* not only hinders individuals from attending therapy (Ronzio et al., 2006), but also plays a contributing role in the search process. Clinicians can address the *location* barrier through highlighting their proximity to potential clients in their websites and advertising. Clinicians can also advocate for search engines (e.g., Google) to prioritize search results of mental health services based on the proximity to the client’s IP address. It is also imperative that clinicians are actively informed on the sources of information available online to aid in developing tools that promote reliable advice and resources (Chen & Zhu, 2016). Additionally, as the internet continues to become an integral role in many people’s lives, clinicians can be a guide for clients seeking additional resources on the

internet, a key step in increasing accessibility of mental health services (Thornton et al., 2017). Results also indicate that it could be beneficial for clinicians to mention specific ailments they treat (e.g., depression and anxiety), as well as their professional identity (e.g., Licensed Professional Counselor). Given that individuals use the Internet for mental health information acquisition, results of this study generally suggest a push for clinicians to have a greater online presence to promote mental health services to reduce the gap between prevalence and utilization of services.

Limitations and Future Research

To the best of our knowledge, this is one of the first studies to examine the information acquisition process to reduce the need versus utilization gap. Despite this strength, there are some limitations that should be considered. First, participants were a sample of non-treatment seeking college students who were predominantly White and female, which limits the generalizability of the results. As such, future research should address search behavior among individuals who do intend to utilize treatment and examine a wider demographic makeup. Second, this study only examines the search strings used, and not the entire continuum of the search process (i.e., from searching the internet, to deciding who or which mental health institution to contact, to initiating the first contact with mental health treatment providers). Considering information seeking and receiving via a search engine is an iterative process, only examining the search-string used initially instead of allowing participants to engage in the whole search may produce an incomplete picture of the mental health provider decision-making process. Third, the current methodology does not examine the trial-and-error process that is common when searching and selecting information on the internet. Fourth, effect sizes were generally small, and inclusion of other predictor variables not included in this study (e.g., race and ethnicity) could better predict the choice of search string. Finally, this study did not account for or examine internet-assisted mental health services (e.g., online counseling or telemedicine) or its availability, which circumvents the problems associated with location. This last limitation needs to be highlighted given the COVID-19’s impact and the move towards delivering mental health services using internet-mediated communication (data collection for this study was done before the pandemic).

Conclusion

One way to close the mental health service utilization disparity is to understand how potential clients look for mental health services. From an information acquisition processing perspective, the manner of information search

and the information sought could shed light into the decision processes involved in seeking treatment. Results of this study indicated that potential clients generally search for information associated with geographical proximity of available services, information about the psychological problem such as symptoms, and information about the type of treatment and the available treatment resources. Results of this study could help potential clients reduce the cognitive burden involved in mental health service search, as well as help counselors by providing recommendations on what information to provide in their promotional packets and websites.

Data and Instrument Availability Available from the corresponding author upon request.

Declarations

Ethics Declaration Research protocol was reviewed and approved by the Institutional Review Board of the corresponding author's institution. Conventional practices to assure participants' privacy and confidentiality were observed, such as the informed consent process, de-identification of data, and the use of passwords and encryption to secure data.

Conflict of Interest The authors declare no competing interests.

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