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## The mental health information needs of Chinese university students and their use of online resources: a holistic model

### Abstract

**Purpose** – This research aims to explore the nature of Chinese students' mental health information needs and to identify the online resources they use to meet those needs.

**Design/methodology/approach** – Data was collected from three Chinese research-oriented universities using semi-structured interviews and a survey. 25 university students with varied backgrounds were selected for semi-structured interviews to explore the triggers and nature of their needs. Then, printed and online questionnaires were distributed to undergraduate and postgraduate students and 541 valid responses were processed for descriptive statistical analysis and variance analysis.

**Findings** – It was found that: 1) the triggers of university students' mental health information needs mainly are mental health being in the news, personal interest in gaining mental health knowledge, mental health issues, required formal learning and preparation for mental health counselling; 2) Eleven types of information are used, with an emphasis on employment pressure, study stress and self-understanding; 3) Mental health information needs differ with mental health status and some social-demographic factors (including gender, urban or rural origin, and educational stage); 4) Information needs can be characterised as dynamic, complex, diverse but concentrated ~~but concentrated~~ on a few types, ambiguous and hard for participants to define, private, stigmatized, self-dependent, and substitutable; 5) Internet sources most used to meet such needs are mainly search engines, Q&A (Question & Answer) platforms, public social media platforms, [mental health online platforms hosted in university](#), [online education platforms \(e.g., MOOC\)](#), and [professional mental health online platforms](#). ~~et al~~; 6) A model of mental health information needs was built based on the above findings to map the whole process from what

triggers a need, to the content and characteristics of information need, and online resources used to meet those needs.

**Practical Implications**—The paper provides suggestions for university mental health services in developing more tailored knowledge contents via effective delivery methods to meet diverse needs of student groups.

**Originality/Value**—This research is novel in using empirical data to build a holistic model that captures the context and the nature of mental health information needs of university students.

**Key words**— University students, Mental health information, Online information resources, Mental well-being, Information need

**Paper type**— Research paper

## 1. Introduction

Mental health problems are quite common among university students [and they have become a serious concern in many countries](#) (Eisenberg *et al.*, 2013; Kotera *et al.*, 2021; Harrer *et al.*, 2019; Sheldon *et al.*, 2021). A variety of factors can lead to such experiences including academic pressure, separation from the [student's](#) family, financial stress and the challenges of facing adult-like responsibilities with inadequate skills (Pedrelli, *et al.*, 2015). Consequently, university students [may be](#) at greater risk of mental health problems such as anxiety disorder, depression, eating disorders, self-harm and even suicide than same-aged non-students (Pedrelli *et al.*, 2015). A survey of Chinese youth mental health conducted in 2019 reported that university students' risk rate of depression is 6.6%, and the severe anxiety rate is 3.9% (Zhang, 2019). Most of the other evidence we have is from the US. Data from there suggests that the probability of moderate to severe anxiety in postgraduate student groups was more than six times that of [the](#) general population (Evans *et al.*, 2018). Levecque *et al.*'s (2017) study shows that one in two PhD students suffer psychological distress, and 32% of PhD students are at risk of common

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4 psychiatric disorders such as depression. It is not known if these patterns are reproduced  
5 internationally but it does seem that students are facing increased vulnerability to mental health  
6 issues: the global prevalence of depression in university populations increased by 18.4% from  
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8 2005 to 2015 (Lipton *et al.*, 2016).  
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13 The need for mental good health should be considered equally as important as physical health,  
14 however, in contrast to the extensive literature on physiological/physical health information  
15 needs, very little is known about mental health information needs according to Powell and  
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17 Clarke (2006). Relatively few studies have addressed mental health related information needs,  
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19 and they mainly focus on those of psychiatric patients (e.g., Cleary *et al.*, 2005; Pollock *et al.*,  
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21 2004) or illness-specific information needs (e.g., Pier *et al.*, 2008) or searches associated with  
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23 particular mental-disorders (e.g., Ayers *et al.*, 2013). This neglects the majority of the population  
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25 who do not have a medically diagnosed condition but have information needs for ensuring their  
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27 mental well-being or simply living a better life. Information can satisfy many different types of  
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29 mental health needs, including the needs for security, achievement, self-expression and  
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31 self-actualisation (Wilson, 2006), therefore, mental health information needs can be triggered not  
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33 just in the context of having a diagnosed medical condition or supporting someone who does  
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35 (Zhao and Zhang, 2017). Thus the issue of student access to mental health information is  
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37 significant even if we set aside the high prevalence of mental health issues among them.  
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43 Universities have provided many channels of mental health services and resources which might  
44 positively affect students' mental health, such as self-help books, tele-psychiatry, telephone  
45 counselling, face-to-face delivery of counselling services and interventions for students with  
46 psychiatric disorder (Leach *et al.*, 2017; Hunt & Eisenberg , 2010). However, researches  
47 demonstrates that young people usually have low-levels of help seeking behaviours from formal  
48 services regarding their mental health (e.g., Rickwood *et al.*, 2007). For university students who  
49 have mild mental issues or have the information need for supporting mental well-being rather  
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4 [than medical care or mental illness information, they are more oriented towards self-reliance via](#)  
5 [using the Internet for mental health information rather than seek professional help \(Horgan &](#)  
6 [Sweeney, 2010; Barney \*et al.\*, 2006\).](#) ~~If the need for information about mental health is pervasive,~~  
7 ~~a~~ ~~A~~ number of factors inhibit people, including students, from seeking information ~~relating to it~~  
8 from formal [professional psychological help](#) services such as [offline](#) counselling centres. These  
9 include the desire for privacy, social prejudice, lack of professional support, [skepticism about](#)  
10 [effectiveness of treatment](#), stigma and inadequate mental health awareness ([Eisenberg \*et al.\*,](#)  
11 [2007](#); Murphy, 2017; Deasy *et al.*, 2016; Hantzi *et al.*, 2019). The Internet's advantages of being  
12 easily accessible, confidential and private, as well as containing an enormous amount of  
13 information make it a commonly used source of information for university students (Montagni *et*  
14 *al.*, 2016a; Horgan & Sweeney, 2010). This justifies focusing particularly on Internet searching  
15 for mental health information.

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29 Powell and Clarke (2006) suggest that the majority of publications on mental health information  
30 needs are based on the views of information professionals rather than studies of information  
31 users. Thus, it is of value to conduct an empirical investigation of students' needs and their use  
32 of online information to meet these needs to provide the theoretical basis for more tailored  
33 guidance for them. [According to Ormandy \(2011\), it is essential to consider and understand the](#)  
34 [context/situation and purpose of the information user when studying health-related information](#)  
35 [needs. Accordingly, to gain a holistic view, this research aims to systematically investigate](#)  
36 [university students' online mental health information needs as well as their context/situation and](#)  
37 [uses of online resources.](#) Compared to physical health information needs, mental health  
38 information needs are relatively more ambiguous, private and indefinable (Zhao and Zhang,  
39 2017). Therefore, users' perspectives and perceptions need to be explored in more depth.

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52 In this context this paper reports research exploring student use of mental health information,  
53 combining semi-structured interview and questionnaire data to gain a holistic view. It poses four  
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research questions:

- 1) What factors trigger university students' online mental health information needs?
- 2) What types of information do students need and how does this differ across the student body?
- 3) What are the main characteristics of student mental health information needs?
- 4) What online resources channels are used to meet such needs?

## 2 Literature review

Information need is traditionally considered as the start state for individual's information seeking behaviours (Cole, 2011). It is also a complex concept which has intrigued researchers for decades (Cole, 2011). Case (20022007) defines information need as a recognition that the individual's knowledge is insufficient to meet their goals. Within the context of health, information need can be defined as the representation of a gap in knowledge which can be rectified by information (Timmins, 2006). Health information needs reflect a lack of knowledge on individual health issues and is the driving force for health information behaviour (Griffin *et al.*, 2004). Ormandy (2011:99) offers a more operational definition in the health context that "information need is a recognition that your knowledge is inadequate to satisfy a goal that you have, within the context/situation that you find yourself at a specific point in the time". These definitions all incorporate the dimension of purpose/goal of the information and recognise the knowledge deficit in reaching the underlying goal.

Research points out the strong connection between the concept of information need and concepts about of questions and question formation. For instance, Wilson (1999) describes the question as the formal expression of an individual's information need, the precursor and the precondition for the occurrence of purposive information seeking. A question is defined by Taylor (1962:391) as "an indication of inadequacy on the part of the inquirer who hopes to remedy that inadequacy by calling on the information system." The information need can be reflected and satisfied through

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4 question formation and question negotiation (Taylor, 1968). Question formation is the  
5 preliminary step that occurs before information seeking behaviours to satisfy the information  
6 need.  
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11 Case (2007) points out that Taylor's (1962; 1968) model of question formation has had a great  
12 influences on studying how an individual's needs are articulated. This model about question  
13 formation and negotiation is highly relevant for health care science librarians and useful for  
14 understanding levels of questioning in the health care context (Kloda & Bartlett 2013). Taylor's  
15 (1962) model captures a four levels of question formation or information needs: visceral need  
16 (Q1), where the need is actual but vague, not even a question yet; conscious need (Q2), where  
17 the individual can formulate the need in his or her mind but the need remains ambiguous.  
18 Individuals may talk to someone to help focus the question at this level; formalized need (Q3),  
19 where the information need is verbally expressed with formal statements in an interrogative or  
20 declarative way; compromised need (Q4), where information users translate their questions to  
21 accommodate an information system or a service. This implies that librarians or information  
22 providers should ascertain users' information need to actually satisfy their conscious need.  
23 Problematic situations are closest to the conscious level of need (i.e., Q2) in Taylor's (1962)  
24 model, where information users feel the necessary to communicate with someone else to make  
25 clarification (Ruthven, 2019). Ruthven (2019) further points out that the process of moving from  
26 conscious need (being capable of describing problematic situations) to formalized need (being  
27 able to ask formal questions) asks for active cognition of contemplating the problems in great  
28 details to move the problem forward.  
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48 St. Jean (2017) suggests that information behaviours have traditionally been described by  
49 beginning with the senesce of having an information need, in other words, recognition of the  
50 "visceral need" (Taylor,1962, 1968) or "anomalous states of knowledge" (Belkin,1980; Belkin  
51 et  
52 al., 1982). However, information behaviours sometimes may occur before the individual's  
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4 awareness of having a particular need (Cole, 2011). St. Jean (2017: 317) proposes such state as  
5 “incognizance”, which is defined as “a situation in which a person is unable to recognize the  
6 presence of a gap and is thus unaware of having a need to seek information” or “having an  
7 information need that one is not aware of”. According to St. Jean (2017), it is similar to Taylor’s  
8 (1962, 1968)<sup>2</sup>s concept of visceral need and Belkin’s (1980) concept of anomalous states of  
9 knowledge but there are differences. Incognizance indicates that the individual does not perceive  
10 the deficit of their knowledge and does not gain a visceral sense of the information need (St. Jean,  
11 2017), and thus it precedes the state of recognizing an information need (i.e., visceral need and  
12 anomalous states of knowledge). Incognizance may greatly demotivate or impedes users’  
13 information seeking and use as a barrier (St. Jean, 2017). In addition, Huttunen *et al.* (2020) also  
14 stress the importance of such early-stage information needs as a chain containing a trigger for  
15 information seeking behaviours as well as articulating and understanding users’ situations.

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29 Individuals usually do not know what is required to fulfill an information need (Taylor,1968).  
30 Accordingly, in order to better understand the information need, researchers point out that it is  
31 crucial to understand the context or information situation of the user where an information need  
32 emerges (Cole, 2011), or the “specific environment” of the information need (Taylor, 1982).  
33 “Context—i.e., information need is produced in the user by the context in which the user finds  
34 him/herself.” (Cole, 2011:1217). This makes it exceptionally fundamental to contextualize the  
35 information need in the users’ situation to make it meaningful (Wilson, 1981; Ormandy, 2011).  
36 Thus, when exploring students’ mental health information needs, it is necessary to start with  
37 identifying factors triggering those needs.

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48 In the context of physical health, the main triggers for students’ information needs has-ve been  
49 found to be their own illness or that of those close to them (Oh and Kim, 2014), personal habits  
50 or preferences (Sbaffi and Zhao, 2020), interest in topics related to health, media coverage of  
51 public health news, unclear items of health examination and doubts about the medical process  
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4 (Pier *et al.*, 2008). Thus, triggers include a much wider range of contexts than directly arising  
5 from illness. Yet in the context of psychological health, most existing research considers  
6 searches arising directly from health problems or illness (e.g., Pier *et al.*, 2008; Ayers *et al.*,  
7 2013). There is some research that investigates wider needs. Besides psychological problems,  
8 other factors can also trigger mental health mental information needs, such as seeking  
9 information to live happily (Farrer *et al.*, 2008), to obtain emotional support to overcome  
10 negative emotions caused by cognitive uncertainty (Ruthven *et al.*, 2018), for a cognitive need to  
11 understand psychological experiences (Aref-Adib *et al.*, 2016), promotion of mental health  
12 advocacy and associated organisations (Aref-Adib *et al.*, 2016), and personal interest and  
13 curiosity (Montagni *et al.*, 2016a; Villagonzalo *et al.*, 2019).

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25 However, much research considers mental health information purely from the perspectives of  
26 psychological problems or medical care (Cleary *et al.*, 2005; Powell & Clarke, 2006; Lal *et al.*,  
27 2018). For example, Ayers *et al.* (2013), ~~based on~~ used medical terms for mental health disorders  
28 ~~to~~; ~~grouped~~ information needs into problem-specific categories, such as ADHD (attention  
29 deficit-hyperactivity disorder), anxiety, bipolar, depression, eating disorders, OCD (obsessive  
30 compulsive disorder), schizophrenia and suicide. Similarly, Montagni *et al.* (2016b) grouped  
31 types of mental health information based on different types of mental disorder. Based on the  
32 process of mental health diseases from source to prognosis and treatment, information needs are  
33 categorised into symptoms and diagnosis, medication (particularly in relation to side effects and  
34 dose) and information on how to cope with illness (Lal *et al.*, 2018). These categorisations are  
35 based on the premise of a subject with a mental health illness, but neglect the learning need for  
36 mental health knowledge and the interest needs aroused by news relating to mental health  
37 illnesses, which are identified in the physical health context (e.g., Pier *et al.*, 2008).

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52 There has been some research that recognises that mental health information needs are broader  
53 than those related to a specific medical condition. Xie *et al.* (2011) identified that the contents of  
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4 students' searches include the following topics: interpersonal communication, emotional  
5 regulation, self-knowledge and development, love and sex, career planning, learning, stress and  
6 others (psychiatry, psychological counselling, hypnosis, etc.). Moreover, a growing literature on  
7 mental well-being and positive mental health is about how to deal with the stresses of modern  
8 life and to live a happy life rather than to deal with a medically defined health condition (Zhao *et*  
9 *al.*, 2018; Seven *et al.*, 2021). Therefore, this creates the need for a more effective typology of  
10 embracing wider information needs.  
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19 In so far as mental health information needs are linked to a specific issue it is relevant to consider  
20 which socio-demographic factors influence the prevalence of mental health issues. It seems that a  
21 wide range of factors can impact susceptibility to mental health problems but one factor is social  
22 inequality. Students' social background or social status in society, including gender (e.g., Sayeed  
23 *et al.*, 2020), being from a one-child family (e.g., Zhan *et al.*, 2017), minority ethnic identity (e.g.,  
24 Yao and Yang, 2017), financial status (e.g., Mojs *et al.*, 2012a), rural or urban origins (e.g., Mojs  
25 *et al.*, 2012b), and educational stage (e.g., Pedrelli *et al.*, 2015), all seem to be correlated with  
26 mental ill health.  
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37 Turning to how the mental health information needs of students are satisfied, Montagni *et al.*  
38 (2016a, 2016b) found that the Internet has become an important source. It is natural for students  
39 to use the Internet to meet many of their information needs, though the resources used are quite  
40 varied (Sbaffi and Zhao, 2020). Previous research revealed that 91.4% of students reported  
41 having sought general health information online, while 49.4% of them had searched for mental  
42 health information at least once (Montagni *et al.*, 2016b). Students hold favourable attitudes  
43 towards online information (Ryan *et al.*, 2010), because it is anonymous, and accessible and less  
44 time consuming to obtain (Oh *et al.*, 2009; Chan *et al.*, 2016). Young adults (i.e., 18–25 year  
45 olds) also have greater awareness of the resources available and better understanding of their  
46 benefits than other social groups (Oh *et al.*, 2009).  
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Evidence shows that sources of information for such searches by students mainly include text-based search engines, Facebook and other social media, informational sites, and forums (Farrer *et al.*, 2015; Montagni *et al.*, 2020). Rasmussen-Pennington *et al.* (2013) found that the most popular resources were YouTube, FMyLife and Facebook among Canadian youth groups. Usually, most of students entered key words into a search engine, portal or ISP when seeking such information (Montagni *et al.*, 2016a). Specially, sources like forums can promote peer-to-peer support, establishing connections with people experiencing similar issues (Chan *et al.*, 2016; Karwig and Chambers, 2016).

### 3 Methodology

To gain a picture of in-depth perceptions of the issue but also of typical behaviour, the researchit mainly— adopted a mixed research method of exploratory sequential design, withand both qualitative and quantitative approaches were used in this study. Semi-structured interviews were undertaken and served as the main means to explore issues including the triggers, contents, and characteristics of mental health information needs. Following this a survey was conducted to collect complementary data to report the frequency of triggers, degree of different needs; factors responsible for variances between different student groups; and distribution of online resources to meet such needs.

#### 3.1 Semi-structured interviews

In March 2019, twenty-five participants were recruited from three research-oriented universities (Wuhan University, Wuhan University of Technology, and Central China Normal University), located in Wuhan, Hubei Province, China. An attempt was made to ensure this sample was representative in terms of gender, educational agestage, majors, information needs and online information usage behaviours (as shown in Table I). The interviewees consisted of eleven male and fourteen female students from different academic degree levels (i.e., 15 UG; 10 PG) and a

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4 variety of discipline backgrounds. To preserve confidentiality, interviewees' identities were  
5 masked with a code consisting of a letter and a number (e.g., A01). Interview questions mainly  
6 focused on [explorative open questions on](#) triggers, contents, and attributes of their mental health  
7 needs. [For instance, the question such as “what triggers your information need for mental health](#)  
8 [information?” was asked.](#) The recorded interviews lasted between 45 to 60 minutes.

### 13 **Table I. Background information of the interviewees**

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17 NVivo 11 software was used to code the interview data and to develop an understanding of the  
18 themes in the data. [In order to build the theoretical framework, an inductive approach was](#)  
19 [adopted to derive themes about triggers, contents, and characteristics of mental health](#)  
20 [information needs from interview data.](#) The analysis procedure was based on the six-step  
21 thematic analysis method for qualitative text data proposed by Braun and Clarke (2006). A  
22 second coder was used to ensure reliability of coding results and to reduce bias to a minimum  
23 (Silverman, 1986). Coding differences between the coders were fully discussed until agreement  
24 was achieved. During the thematic analysis process, no additional themes were found at the point  
25 of analysing A17's interview transcripts. Thus, the analysis reached theoretical saturation at that  
26 point.

### 37 **3.2 Survey**

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40 The survey was distributed to undergraduate and postgraduate students from the same three  
41 universities in April 2019. Printed questionnaires were distributed on-site in the campuses of the  
42 three target universities (such as in the library, classrooms and dormitories), while links to an  
43 online questionnaire hosted on Questionnaire Star were distributed through social messaging  
44 mobile apps of QQ and WeChat. A total of 696 questionnaires were collected, including 300  
45 printed and 396 online. In total, 541 valid questionnaires were received. Among respondents 459  
46 (85%) said that they had used online resources to satisfy their mental health needs at least once.  
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54 Background information of the sample population is shown in Table II.

## Table II. Background information of the sample population for the questionnaire survey

The questionnaire consisted of three sections: socio-demographic information and self-defined mental health status (see Table II), mental health needs, and online resources used. The self-defined mental health status included five options ranked from very poor, poor, average, good, to very good for respondents to choose. According to Derr (1983), the information need is a self-perceived psychological state, not a concrete visible object or complex of symbols. It is quite subjective and cannot be directly observable or measurable. Thus, it is consistent to acknowledge equally that self-defined mental health status could well be subjective and inaccurate too in studying mental health information needs. It is unlike psychological evaluation and psychiatric medical care, which need to accurately measure information user's mental health status with psychological criteria. The questions about mental health information needs included frequency of accessing information, triggers of such needs and contents of information need.

Descriptive statistical analysis and variance analysis were conducted on the questionnaire data. The scores of 11 items related to mental health needs were summarised. The sum score was taken as the indicator of total need. A t-test was used to compare variables between two groups, and variance analysis was used to compare differences among multiple groups at a significance level of 0.05. Test variables referred to the following six items: gender, urban or rural origin, only-child or not, educational stages, household income, and self-defined mental health status. Independent sample t-test was used for items of gender, urban and rural background, and only-child or not; one-way ANOVA analysis was used to compare differences among multiple groups of educational stages, household income, and mental health status.

### 3.3 Research ethics

This research followed the university's ethical research policy and obtained approval from school's social research ethics committee. The introduction of ethical information was provided

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4 [in the interview request and questionnaires. Only university students who gave consent after](#)  
5 [filling consent form were requested to participate in this research. Researchers did not request](#)  
6 [participants to provide their names. The participant was assured that any data collected would be](#)  
7 [kept in secure places and used in an anonymous format. The guidelines for participant safety and](#)  
8 [anonymity were complied with throughout the research.](#)  
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## 13 14 15 **4 Results**

### 16 17 18 **4.1 Triggers of mental health information use**

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21 Survey results show that 17% of the surveyed students paid little attention to mental health  
22 information, however the remaining students frequently (17.38%) or occasionally (65.62%) did  
23 so. Five triggers for students' information use were identified in the thematic analysis results [of](#)  
24 [interview data](#), as shown in Table III.  
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31 **Table III. Triggers of University Students' Mental Health Information Use**

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34 Table IV shows the frequency of factors triggering students' need, ranked from high to low. This  
35 shows that the mental health in the news is the most frequent factor that drives student attention  
36 to a topic. An informal interest in gaining mental health knowledge ranks as the second most  
37 frequent trigger. Thus mental health being in the news and informal interest in mental health  
38 knowledge, can both lead to seeking or learning relevant information, more often than having  
39 mental health issues per se.  
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48 **Table IV. Triggers of university students' mental health information needs (N=541)**

### 49 50 51 52 **4.2 Types of mental health information needed**

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55 Eleven types of mental health information that students stated they needed were derived from  
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3 thematic interview data analysis, as shown in the following Table V.  
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7 **Table V. Types of mental health information needed**  
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11 Following up this taxonomy in the survey, respondents were asked to rate the degree of their  
12 need (from 1-5). The results are presented in Table VI. This showed that the most important  
13 concerns were employment pressure, self-understanding, and study stress.  
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19 **Table VI. Average scores of mental health information needs (N=541)**  
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23 We attempted to explore how far these concerns differ across the student population. According  
24 to the t-test results, there were no significant differences in students' needs, based on their  
25 self-described family household income or whether they were an only-child. However, there was  
26 a significant difference in need among student groups for some other socio-demographic  
27 characteristics (i.e. gender, urban or rural origin, and educational stages), and mental health  
28 status, as shown in Table VII and Table VIII.  
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36 As shown in Table VII, female students had significantly higher mental health information needs  
37 than male students in all other aspects except for intimate relationships, study stress, and Internet  
38 dependence. The difference in urban or rural origin was relevant to Internet dependency, with  
39 students from rural families developing a stronger need to address the problem ( $t=-3.098$ ,  
40  $p=0.002$ ). The variance analysis results regarding educational stages show that needs vary greatly  
41 among students at different educational stages (i.e., undergraduate, master and PhD levels).  
42 Specifically, undergraduates had significantly more need for mental health information than PhD  
43 students, which were reflected in the strength of information needs related to employment  
44 pressure ( $F=9.433$ ,  $p=0.000$ ), transition to university ( $F=3.807$ ,  $p=0.016$ ), and Internet  
45 dependence ( $F=5.328$ ,  $p=0.003$ ).  
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6 Not surprisingly, the variance analysis results shown in Table VIII revealed that students with  
7 different mental health statuses also had significantly different information needs. Overall,  
8 students with self-assessed very poor, poor, and average mental health status had significantly  
9 stronger needs for information than those with good or very good mental status. According to the  
10 posteriori comparisons, there is no significant difference in the information needs of employment  
11 pressure, and the more specific details of the group difference between the two is shown in Table  
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**Table VII. Variance analysis for different types of mental health information needs among students of different social-demographic characteristics (N=541)**

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4 **Table VIII. Variance analysis results of the mental health information needs of student groups in different mental health**  
5 **status (N=541)**  
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11 **Table IV. Posteriori comparisons results of the mental health information needs of student groups in**  
12 **different mental health status (N=541)**  
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### 14 **4.3 Characteristics of university students' mental health needs**

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17 Analysis of the interview and questionnaire data suggested a characterisation of student online  
18 mental health needs as: dynamic, complex, diverse but concentrated on a few types, ambiguous  
19 and hard for participants to define, private, stigmatized, self-dependent and substitutable.  
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22  
23 (1) Dynamic. The survey data already presented shows that students at different educational  
24 stages have different needs, and the triggers of the corresponding information needs were also  
25 different. In addition, the specific context of individuals determines how long the needs will last.  
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27 For example, when students realize they have obtained sufficient common-level psychological  
28 information, their information needs may develop into an in-depth level, as interviewee A18  
29 stated:  
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33 *“I used to take some [psychological] tests to find out my mental health situation, but I don't*  
34 *do that anymore because I feel there won't be any difference and I already know what the results*  
35 *look like. Nowadays, I would like to find some more interesting psychology articles to read.”*  
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39 Therefore, ~~the above findings reflect that mental health information~~ these needs can be seen  
40 as changing dynamically over time. The dynamic and stage-relevant nature of their needs also  
41 reflect individuals' development of cognitive maturity and changes of interests in gaining mental  
42 health knowledge. –  
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46 (2) Complex, diverse but concentrated on a few types. The findings show that Uuniversity  
47 students have quite diverse information needs for existence, for relatedness and for growth to  
48 cope with a wide range of stresses from study, interpersonal relationship, immature cognitive  
49 capacity and so on. In addition, ~~such needs are complex, and the~~ strengthdegree of their needs is  
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4 also different. [These findings reflect the complex and diverse nature of the mental health](#)  
5 [information needs](#). Despite a wide range of variety of needs, as revealed by survey results,  
6  
7 students' needs mainly concentrate on four types: about study stress (24.21%), employment  
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9 pressure (23.48%), self-understanding (17.93%), and social interactions/communications  
10  
11 (12.01%), accounting for 77.63% of all kinds of their mental health information needs. This can  
12  
13 be explained by their similar social roles and contexts.  
14

15 (3) Ambiguous and hard for participants to define. Although an individual is somewhat  
16  
17 aware of their information needs, it is not easy to articulate them precisely. For instance,  
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19 interviewee A05 commented that:  
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21 *“When I’m very depressed, for example, when I don’t feel the meaning of my life, I will*  
22 *search ‘what’s the meaning of life’ on Baidu. Then I will see some webpages of mental health*  
23 *consultants, but I cannot find any useful information there. In fact, I don’t know what*  
24 *information I really want and how to express my feelings accurately. I just feel that I don’t want*  
25 *to do anything other than play with my mobile phone all day.”*  
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31 (4) Private. The interviews revealed that students tended to wish to maintain privacy about  
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33 their information needs about some mental health issues like depression, or intimate relationship  
34  
35 issues. For example, interviewee A10 said that some topics were very private and were usually  
36  
37 kept hidden from others.

38 *“Some mental health information needs are quite private, such as sex perplexity, conflicts*  
39 *with others, and so on. I pay quite a lot of attention to privacy protection and delete my online*  
40 *browsing history every time.”*  
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44 (5) Stigmatized. We know that stigma remain attached to mental problems. Students or their  
45  
46 families may agree with those stereotypes. This makes the information needs for mental health  
47  
48 continually stigmatized. Some interviewees stated that their parents believed mental health  
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50 problems can bring shame and the related information needs are also disgraceful. For instance,  
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52 interviewee A03 stated:  
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54 *“You can imagine that my parents don’t want to admit my psychological problem. It feels*  
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4 *like a shame to them, and they even warned me not to disclose to others that I have mental illness*  
5 *or that I look for such information. They make me feel having such kinds of information need is a*  
6 *cause of guilt. I have no choice but secretly search some online information like doing some bad*  
7 *things on the Internet.”*  
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11 (6) Self-dependent. When students were facing mental health issues, they usually chose to  
12 deal with the issues by themselves and sought information on the Internet instead of seeking help  
13 from others. The main reasons behind this were articulated with such statements as “unwilling to  
14 show negative emotions” (interviewee A05), “don’t want them to worry about me” (interviewee  
15 A16), and “don’t want to be troublesome” (interviewee A12). For example, interviewee A08  
16 stated:  
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23 *“When I realised I may have depression, at the beginning, I planned to tell those who had a*  
24 *history of depression. Then I thought it’s better not to worry them. Then I thought about talking*  
25 *to my parents, but I was afraid that they would get too nervous and overreact, so I didn’t talk to*  
26 *them. I didn’t think it was necessary to talk to my classmates. I might just deal with it all by*  
27 *myself and search on the Internet.”*  
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33 (7) Substitutable. Mental health information could be substituted by other types of  
34 information that can solve practical issues that are causing the stress. Thus, in some cases, the  
35 role that mental health specific information played in solving substantive mental issues was quite  
36 limited. Sometimes students would opt to search for information that could solve the practical  
37 issue and fix it themselves. As interviewee A04 commented:  
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43 *“My pressure is mainly from my study, I am sure I need to work hard for it, to learn better*  
44 *learning methods and habits; similarly, facing with my anxiety in career planning, I will get to*  
45 *know more information about it from my senior, so as to alleviate psychological pressure by*  
46 *solving these substantive problems.”*  
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#### 51 **4.4 Online resources used for mental health information**

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54 The questionnaire analysis results showed that respondents have quite distinctive behavioural  
55 patterns when searching for mental health information. 63.6% of respondents reported that they  
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4 have encountered mental health information serendipitously, showing that most students  
5 accidentally noticed and read such material while browsing the Internet for other purposes. This  
6 was the commonest way information was encountered. It is worth acknowledging that after a  
7 random encounter, those students do then intentionally click on these links to get more  
8 information to meet their needs. 50.8% of respondents used the Internet to search for specific  
9 information to meet their mental health information needs but only 11.1% have continuously and  
10 frequently tracked certain kinds of such information through searching or browsing over a long  
11 period. Thus most searching is not of a sustained character.  
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21 Table X revealed which online resources students used to obtain information in this context.  
22 Among them, search engines, Q&A (Question & Answer) platforms, and public social media  
23 platforms (e.g., QQ, WeChat, and Weibo) were the most frequently used. Although mental  
24 health online platforms (including websites, social media platforms, and online courses) hosted  
25 in university and professional mental health online platforms can provide more relevant services,  
26 they are not yet common choices among students.  
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35 **Table X. Online resources to satisfy university students' mental health information needs (N=459)**  
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39 On one hand, professional mental health online platforms lacked public awareness; on the other  
40 hand, many students had established stereotypes towards their usefulness and did not understand  
41 the contents or services they provide.  
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46 *"Firstly, I should say it was quite habitual. I would just search according to my browsing*  
47 *[searching] habits as usual. Secondly, I had some concerns about professional platforms' cost*  
48 *and confidentiality, and I thought there might be more theories than practical guidance. Those*  
49 *might be my stereotypical thoughts, but the truth was that I didn't know much about it."*  
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54 (Interviewee A10)  
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As regards students' knowledge of universities' online mental health services, as shown in Table XI, most students interviewed were aware. Mental health websites were the most well-known to students, however, their knowledge of contents on social media platforms and online courses was relatively limited. *"I didn't know what's available at all. I was in a training workshop when I learned about a mental health website in our college, and there I got to know such a channel for online support. But I seldom used it after visiting it once, and my classmates never heard of it."* (Interviewee A03). This indicates that the universities were not very successful in promoting their online services.

**Table XI. Knowledge of the respective university's online mental health services (N=459)**

#### 4.5 Model of students' – MHH mental health information needs and use of online resources

Drawing on findings from both interviews and a survey, a holistic model mapping university students' mental health information needs and their use of online resources was constructed (Figure 1). This model incorporates triggers (which explain the context and situation of the needs), the nature of the information needs (including contents, and features of needs, and variance of needs among different student groups), and online platforms for meeting the needs.

Figure 1. Model of students' Mental Health Information needs and use of online resources

## **5. Discussion**

According to the interviewees, mental health issues, interest in gaining mental health knowledge, mental health being in the news, and preparation for mental health counselling, as well as required formal learning, triggered students' use of mental health information. Most previous studies have focussed on people with a mental health condition (e.g., Montagni *et al.*, 2016b; Lal *et al.*, 2018; Zhao *et al.*, 2018), in contrast, this research provides empirical evidence that direct

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4 mental health issues rank only third place among all triggering factors. The findings reveal that  
5 mental health being in the news and informal interest in mental health knowledge more  
6 frequently trigger students' use. This is in line with other evidence that in the wider population  
7 people are more concerned with information for well-being and living a better life rather than  
8 related to health problems or medical care (Zhao *et al.*, 2018; Seven *et al.*, 2021; Zhao and  
9 Zhang (2017).  
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17 The types of information students use were in line with their social role; that is, they relate to the  
18 joint pressure of university, society, and interpersonal relationships (Pedrelli, *et al.*, 2015).  
19 Concerns about future employment and then study stress were the top issues, reflecting the  
20 specific concerns of being a student. Then came knowledge for self-understanding, for mental  
21 health awareness, and for social interactions. According to the students' challenges identified by  
22 Pedrelli, *et al.* (2015), the information need for self-understanding and mental health awareness  
23 is about coping with the challenges of immaturity, while the information need for social  
24 interactions/communications seeks to improve their inadequate inter-personal skills,  
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35 The survey results showed that Chinese students' social-demographic attributes contribute to  
36 group differences in mental health information needs. This is in line with Montagni *et al.*'s  
37 (2016b) finding that types of mental health information searched for by Spanish students are  
38 correlated with socio-demographic attributes. Our findings show that female students have a  
39 significantly higher interest than male students in most areas of mental health information.  
40 Previous studies have suggested that female students are more interested than male students  
41 about mental health and are more likely to seek online mental health information using the  
42 Internet (Montagni *et al.*, 2016a). Ni *et al.* (2009) identifies that students who are not local  
43 residents of the city where they are studying have a higher probability of Internet addiction. This  
44 could help explain our finding that students from rural backgrounds are more concerned about  
45 Internet addiction: presumably it arises from attempting to stay in contact with friends and family  
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4 in another location to overcome the pressure created by trying to adapt to the new urban  
5 environment. Another possible reason can be that students from rural areas have less chances of  
6 accessing Internet or smart phones before they enter the university so have less experience of  
7 managing their connectivity.  
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13 According to the interview data analysis, students' needs were dynamic, complex, diverse but  
14 concentrated on a few types, ambiguous and hard for participants to define, private, stigmatized,  
15 self-dependent, and substitutable. Much of this is strongly related to the specific attributes of  
16 mental health. Stigma is frequently associated with mental health problems and hinders seeking  
17 resources (Powell & Clarke, 2006; Mishra *et al.*, 2009). Mental health issues usually have quite  
18 sensitive nature, which usually leads to stigma (Eisenberg *et al.*, 2009). This research empirically  
19 confirms previous researchers' (Eisenberg *et al.*, 2009; Berger *et al.*, 2015) idea that students'  
20 stigmatizing attitudes about these sensitive mental health issues usually cause lower help-seeking  
21 behaviours. This research also identifies that stigma ~~It~~ usually leads to self-dependence for  
22 information by encouraging students to seek information through the internet. This finding  
23 confirms with Ayers *et al.*'s (2013) suggestion that people with mental health problems are  
24 oriented to explore their problems online due to mental health's stigma, complexity and obstacles  
25 for gaining support. Especially, stigma can inhibit the decision to seek mental health counselling  
26 information (Lannin, *et al.*, 2016). In accordance with Taylor's (1968) view that information  
27 need is a "black box", which is unknowable, ambiguous and nonspecifiable to information users  
28 when inquiring the information system requesting information from an information service,  
29 a Another unique characteristic of mental health information needs identified in this research are  
30 is their ambiguous, hard to define quality. This finding aligns with Wilson's (2006) statement  
31 that neither the psychological needs nor their satisfaction can be consciously expressed by the  
32 individual. This phenomenon is especially salient in the question formations when seeking  
33 mental health information. It seems to be consistent with findings of Taylor (1982) and Belkin *et*  
34 al. (1982a, b) that users usually formulate their queries incorrectly because of the nonspecifiable  
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4 and ambiguous nature of information needs. The quality of hard to define nature can be  
5 explained by Belkin et al. (1982a)'s idea that users do not know what aspects of their knowledge  
6 of the broader topic area can be used to formulate the question.  
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11 Survey results show that a small percentage (i.e., 17%) of the surveyed students paid little  
12 attention to mental health information due to lack of an awareness of mental health information  
13 need. This finding empirically supports St. Jean's (2017) idea that the existence of incognizance  
14 may greatly demotivate or impedes users' information seeking and use. Students experiencing  
15 incognizance are incapable to recognize that they have incidentally encountered potentially  
16 useful information and therefore, do not consider such experience as a serendipitous information  
17 encounter (St. Jean's, 2017).  
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27 Most Uuniversity students still have relatively high awareness of online mental health  
28 information and the high information literacy to use multiple online information resources to  
29 meet their needs compared with other social groups (Montagni *et al.*, 2016a). The resources they  
30 use include search engines, Q&A platforms, public social media platforms, mental health online  
31 platforms hosted in university, online education platforms, professional mental health online  
32 platforms, digital platforms of traditional media, and digital libraries. Among them, mental  
33 health websites in university, online education platforms, and digital libraries are resources  
34 uniquely available to students. The survey finding about multiple online resources selection by  
35 university student groups confirms empirically the suggestion of Sbaffi and Zhao (2020) who  
36 identified the wide range of information resources selected in health searching. It is a novel  
37 finding that most students in these three universities were aware of university online services but  
38 did not use them.  
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50 ~~Drawing on findings from both interviews and a survey, a holistic model mapping university~~  
51 ~~students' mental health information needs and their use of online resources was constructed~~  
52 ~~(Figure 1). This model incorporates triggers (which explain the context and situation of the~~  
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needs), the nature of the information needs (including contents, and features of needs, and variance of needs among different student groups), and online platforms for meeting the needs.

**Figure 1. Model of students' Mental Health Information needs and use of online resources**

## 6. Conclusion

### *Theoretical implications*

Unlike previous research on mental health information, which mainly focuses on patients with mental problems or information about different types of mental health issue, this paper investigated the mental health information needs of university students as a whole. This is well justified because it was found that a large portion of students seek mental health information, even if they do not have a medical need.

The research used data from both semi-structured interviews and a survey to explore empirically triggering factors, the nature of the information needs (including contents, features, and factors responsible for variances of needs among different socio-demographic groups), and the online resources used to meet such needs. The research contributes a holistic model based on solid empirical findings to illustrate the whole process from emergence of needs (i.e., context) to the information contents and the resources needed to satisfy the need.

Focusing on the nature of mental health information needs, which has received very limited attention, enables the paper to make a useful theoretical contribution to health information research to complement existing research on physical health information needs. Exploring a wide range of triggering factors provides more concrete contexts where information users use information. It also empirically specifies the unique attributes of mental health information needs, which are distinct from physical information need, and redirects researchers' attention to such emergent needs in the general population. Therefore, it lays a theoretical foundation for future research on needs as well as for support services.

### *Practical implications*

The findings of this research have significant practical implications for optimising mental health services by providing more tailored information and improving students' mental health related online information behaviours. Firstly, due to the variety of triggering factors and the dynamic features of such information needs, universities should consistently track students' information needs to gain accurate understanding through surveys and other means before launching tailored services. Secondly, the survey results suggest that universities should actively construct resources via multiple online platforms, especially students' preferred social media and Q&A platforms. Universities should also pay more attention to the promotion of online information resources and platforms in order to maximise their use.

Thirdly, according to our findings, universities should provide a wide range of types of authentic high-quality information to meet students' diverse needs, especially about employment pressure, study stress, self-cognition, and mental health awareness. This would compensate for deficiency in the contents and information quality of open online resources.

Fourthly, accordingly to given that St. Jean's (2017) the incognizance is below the level of visceral need in Taylors' (1962, 1968) model, the mental health service should pay attention to college students' need at a much earlier stage of forming an awareness of information need to help them become more capable of timely recognize potential usefulness of information. In addition, to reduce detrimental influences of incognizance as well as to better capture students' visceral need and conscious need, the question-asking should be considered as equally important as the question-answering in providing mental health information and service. Thus, information providers should give assistance to users not only in question answering but also question asking (Kloda & Bartlett 2013). Researchers stress that it is vital to understand the context of the information need or information situation of the user (Cole, 2011; Taylor, 1982). Similarly,

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4 Ruthven (2019) suggests that the emphasis on the situation of the information need may be more  
5 useful than focus on the information need itself. Thus, getting to the real mental health  
6 information needs must beact on the premise that sufficient knowledge about the context or  
7 situation of the information need/ or in which a question is asked. Moreover, the situation can be  
8 a vital approach of presenting needs when information user cannot properly form questions or  
9 statements about their information need (Ruthven, 2019). Therefore, a situation-based  
10 understanding of the information need should be taken into account when designing the  
11 information system for proving mental health information.  
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21 Lastly, universities should grasp characteristics of such needs in the information provision  
22 process. Ffor instance, given mental health information needs' ambiguous and hard to define  
23 nature, more detailed information with symptom descriptions should be given in plain language  
24 to enable students easily understand their own mental health situation and correctly formulate  
25 questions when seeking assistance or information. Additionally, when delivering the information,  
26 mental health information providers should transform the complex and ambiguous mental health  
27 information within the context of university students' daily liveslife and studiesstudy. Given the  
28 private nature of mental health information needs, in the promotion of university resources, it  
29 should be emphasised that students' access and use of universities' online information resources  
30 are kept confidential throughout. As for the stigmatized and self-dependent features of  
31 information behaviour, students should be encouraged to actively seek help from professional  
32 mental health services. AThe mental health related stigma-reduction campaign and publicity in  
33 the campus can be adopted to lower down such barriers of seeking help. Moreover, according to  
34 St. Jean (2017), the proficient and actionable mental health information provision within  
35 students' everyday-life environment can help not only decrease students' stigma caused by  
36 mental health issues but also reduce the incognizance of mental health information needs.  
37 Moreover, universities should be aware of the different contents of information needs caused by  
38 group differences in gender, urban or rural origin, educational stages, and mental health status. In  
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4 order to deliver more tailored information, individualised information push service/notification  
5 services which deliver customised information could be incorporated into universities' online  
6 social platforms.  
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### 10 11 ***Limitations and research recommendations*** 12

13 A limitation of this study is that it focused on just three Chinese research-intensive universities,  
14 and wider types of universities (e.g., teaching oriented universities) need to be studied to gain a  
15 more complete picture of student needs in China. Additionally, it did not analyse the reasons  
16 causing the variance of needs among different student socio-demographic groups. ~~These areas~~  
17 ~~would be fruitful directions for further research.~~ Thus, further analysis can be made on exploring  
18 reasons behind different mental health information needs of college student groups. Research  
19 into addressing the stigmatizing attitude towards mental health information need and promoting  
20 its awareness would also be of interest.  
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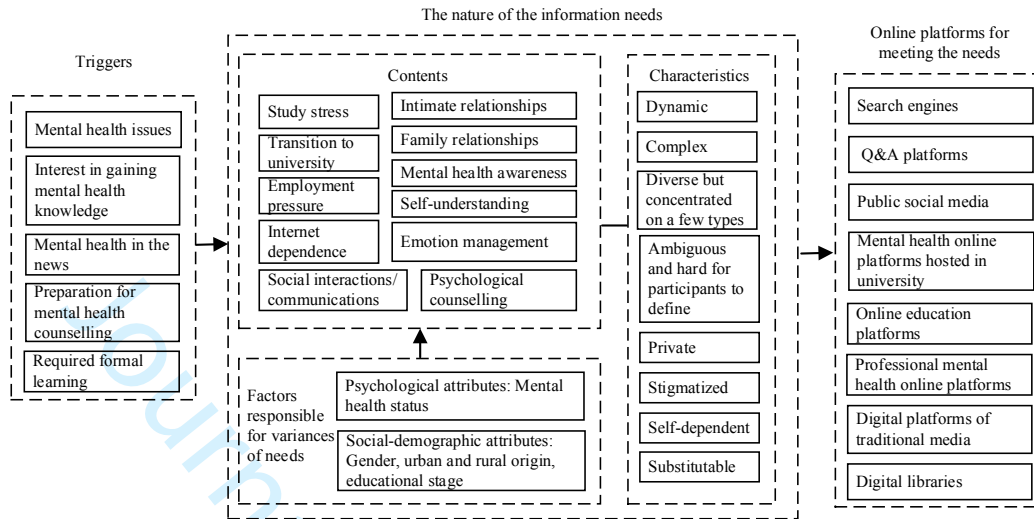
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**Figure 1. Model of students' Mental Health Information needs and use of online resources**

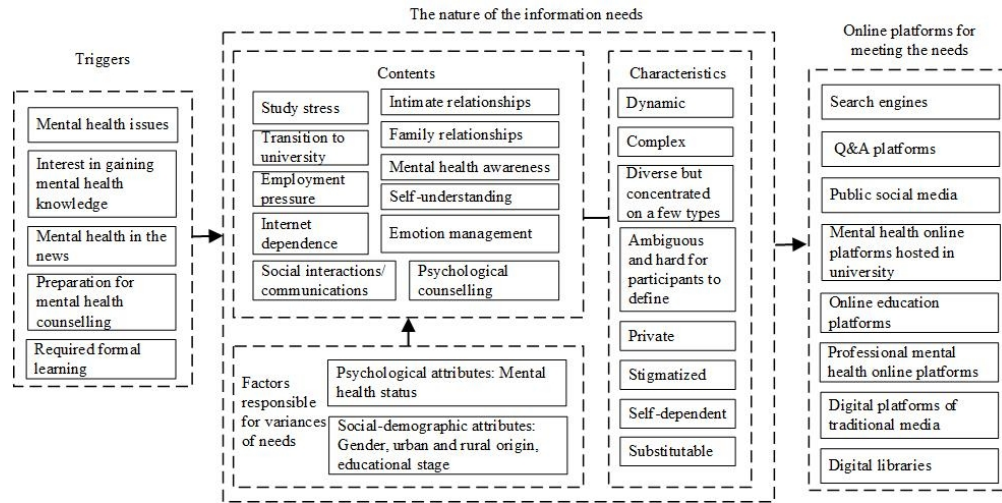


Figure 1. Model of students' Mental Health Information needs and use of online resources

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**Table I. Background information of the interviewees**

Number	Gender	Education Stage	Major
A01	Male	Undergraduate	Music
A02	Female	Undergraduate	Economics and Business Management
A03	Female	Undergraduate	Sinology
A04	Female	Postgraduate (Master)	Physical Chemistry
A05	Female	Undergraduate	English Education
A06	Male	Postgraduate (PhD)	Politics
A07	Female	Undergraduate	Information Management and Information System
A08	Male	Undergraduate	Statistics
A09	Female	Undergraduate	Community Work
A10	Male	Postgraduate (Master)	Information Technology in Education
A11	Female	Undergraduate	Physics
A12	Female	Undergraduate	Public Economics and Management
A13	Female	Postgraduate (Master)	Composition Literature
A14	Female	Undergraduate	Biology
A15	Female	Postgraduate (PhD)	Literature and Art
A16	Female	Undergraduate	E-commerce
A17	Male	Undergraduate	Electronic and Information Engineering
A18	Female	Undergraduate	Science of Design
A19	Female	Undergraduate	Remote Sensing Science and Technology
A20	Male	Postgraduate (PhD)	History
A21	Male	Postgraduate (PhD)	Accounting
A22	Male	Postgraduate (Master)	World History
A23	Male	Postgraduate (Master)	Information Science
A24	Male	Postgraduate (PhD)	Library Science
A25	Male	Undergraduate	Analytic Chemistry

**Table II. Background information of the sample population for the questionnaire survey**

	Item	Frequency	Percentage
Gender	Male	259	47.87
	Female	282	52.13
Urban or rural origin	Urban	302	55.82



	Rural	239	44.18
	Yes	238	43.99
Only-child	No	303	56.01
	Below average	89	16.45
	Average	364	67.28
Household income	Above average	68	12.57
	High	20	3.70
	Wuhan University	138	25.51
	Wuhan University of		
University	Technology	133	24.58
	Central China Normal University	270	49.91
	Undergraduate students	353	65.25
Educational stage	Master students	119	22.00
	PhD students	69	12.75
	Humanities and Social Sciences	149	27.54
	Science	116	21.44
	Engineering	149	27.54
Subject	Agriculture	2	0.37
	Medicine	13	2.40
	Management	96	17.74
	Art	16	2.96
	Very poor	10	1.85
	Poor	38	7.02
Self-defined mental	Average	195	36.04
health status	Good	226	41.77
	Very good	72	13.31

Notes: n=541; The ranking of household income is based on the statistical data of 2020 China national per capita disposable income ([http://www.gov.cn/guoqing/2021-04/09/content\\_5598662.htm](http://www.gov.cn/guoqing/2021-04/09/content_5598662.htm)).

**Table III. Triggers of University Students' Mental Health Information Use**

Theme	Definition	Example
Mental health issues	Information users' psychological problems or issues experienced by respondents or their close ones (e.g., family members and friends).	A13: I pay attention to depression because I have friends who may have this tendency, so sometimes I search online for encyclopaedias about "depression" or other related information to see if I can help them.
Informal interest in gaining mental health knowledge	The user's interest in mental health knowledge and eagerness to improve their mental health knowledge.	A09: I pay attention to online information about depression because I am interested in popular scientific [psychology] knowledge. For example, sometimes they explain some reasons about why people have such [depressed] feelings and behaviours in specific situations.
Mental health in the news	Exploring relevant mental health information under the impact of mental health related news or	A04: I notice such information about suicide news and emotional abuse [news] is mainly distributed through social media like Weibo;

	publicity.	then I will search, and follow the progress [of these events] and related mental health knowledge such as depression and gaslighting.
Preparation for mental health consultation	Preparation for a mental health consultation or further verification of previous consultations.	A03: For my own tendency of depression, I frequently searched for all kinds of information related to depression and how to make a psychological counselling appointment in the university and get professional help.
Required formal learning of mental health knowledge	Compulsory formal learning around mental health as a student in the discipline of psychology or taking selective psychology courses.	A20: I attended my second degree in psychology. I found that reading some online information about mental health issues has broadened my knowledge and deepened my understanding.

**Table IV. Triggers of university students' mental health information needs (N=541)**

Triggers	Number	Percentage
Mental health in the news	305	56.38
Informal interest in gaining mental health knowledge	289	53.42
Mental health issues	253	46.77
Preparation for mental health consultations	51	9.43
Required formal learning of mental health knowledge	16	2.96

Notes: This is a multiple-choice question, resulting in the total exceeding 100%.

**Table V. Types of mental health information needed**

Theme	Definition	Example
Information about study stress	Information about solving anxiety in the formal learning process and exam pressure, etc.	A12: When I decided to take the postgraduate entrance examination for the second time rather than look for a job, I searched for people sharing their experience, especially about the psychological pressure in the process of preparing for the exam.
Information about transition to university	Information about adapting to university life and local living environment of the university, such as new learning environment, local climate, customs and habits, diet, etc.	A08: When I first came to this university as a freshman, I was very uncomfortable with the new learning environment, being sad and feeling depressed. I thought that I needed to see how other students cope with these mental issues on some question-and-answer platforms like Zhihu.
Information about employment	Information to cope with employment-related stress, such	A12: I was looking for a job before, being very anxious. My supervisor would also ask the progress

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3	pressure	as pressure from career	of the job seeking, so it was very stressful for me
4		prospects confusion, job	and I was in great need of some psychological
5		seeking, job interview, etc.	information to tell me how to overcome such career
6			anxiety and relax.
7			
8	Information about	Information about overcoming	A08: I was very decadent for a long period, playing
9	Internet	excessive and compulsive uses	online games being my normal life, even staying up
10	dependence	of Internet, such as mobile	late; and losing interest in other things. I searched
11		phones and other online devices,	the Internet and hoped that I could find something
12		Apps, and online games, to the	useful to help get rid of such annoying addiction.
13		detriment of one's life quality,	
14		mental and physical well-being,	
15		and causing negative	
16		consequences.	
17			
18	Information about	Mental health information about	A01: In the past I had some severe conflicts with
19	social interactions	solving problems in social	some acquaintances due to misunderstandings of my
20	/communications	interaction, interpersonal contact	words, so I don't talk much with others [in case of
21		and communication, such as	misunderstanding] since then. Now I pay special
22		social phobia.	attention to online information to help overcome
23			such mentality of fear of communication, and make
24			my interpersonal communication appear more
25			normal in the university.
26			
27	Information about	Information about love related	A13: Sometimes, there would be some friction or
28	intimate	problems as well as associated	conflict with my boyfriend; then I would search
29	relationships	sexual issues, etc.	mental health information about dealing with
30			affectional issues, and trying to understand the
31			different psychology between us and adjusting my
32			mindset.
33			
34	Information about	Information about relationship	A07: My mental health problem is attributed to my
35	family	problems with family members,	family. When I was a child, I felt very insecure and
36	relationships	such as generation gap.	introvert, I always feel that it was all my fault for the
37			trouble matters, resulting in difficulty of exposing
38			myself to others due to my family problems. I
39			cannot tell anyone but try to search some
40			information to help heal the gulf between my parents
41			and I.
42			
43	Information about	Information about	A15: I feel that I will face a lot of research anxiety
44	mental health	understanding anxiety,	in my postgraduate period, especially during my
45	awareness	depression and other related	PhD, so I really want to know this kind of mental
46		mental health problems, and	health information, thus searching for information to
47		prevention of such	prevent myself from psychological problems, for
48		psychological problems in order	example using "research anxiety" as the [search]
49		to improve one's mental	keywords.
50		wellbeing.	
51	Information about	Information about	A18: I just want to understand myself better through
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self-understanding	understanding of oneself through self-observation and self-evaluation, knowing the personality and temper of oneself, in order to achieve self-regulation and develop one's personality.	online [psychological] tests; I have always tried to understand what kind of person I am and find ways to improve my mentality.
Information about emotion management	Information about controlling feelings in oneself and others and mastering emotions, such as managing one's irritability, irascibility, and alike.	A17: I pay more attention to collect online information about how people view things in life, especially things they dislike, to learn emotional management and inner peace.
Information about psychological counselling	Information about choices and counselling skills of mental counselling when one or others have mental problems.	A03: I tried to find information on the Internet about how to make a reservation and express my mental situation, for there are online and offline psychological counselling services in our university.

**Table VI. Average scores of mental health information needs (N=541)**

Contents	Mean± SD
Study stress	3.54±1.021
Transition to university	2.42±1.126
Employment pressure	3.66±.998
Internet dependence	2.37±1.141
Social interactions/communications	3.21±1.085
Intimate relationships	3.07±1.122
Family relationships	2.99±1.141
Mental health awareness	3.30±1.095
Self-understanding	3.55±1.070
Emotion management	2.90±1.129
Psychological counselling	2.77±1.047

**Table VII. Variance analysis for different types of mental health information needs among students of different social-demographic characteristics (N=541)**

		Study stress	Transition to university	Employment pressure	Internet dependence	Social interactions/Communications	Intimate relationships	Family relationships	Mental health awareness	Self-understanding	Emotion management	Psychological counselling
Gender	Male (Mean ± SD) N=259 (47.87%)	3.49±1.094	2.32±1.117	3.46±1.079	2.38±1.206	3.10±1.125	2.98±1.115	2.88±1.160	3.12±1.139	3.36±1.137	2.77±1.178	2.61±1.023
	Female (Mean ± SD) N=282 (52.13%)	3.59±.948	2.52±1.126	3.84±.880	2.35±1.081	3.30±1.040	3.15±1.123	3.10±1.115	3.47±1.027	3.73±.971	3.02±1.069	2.92±1.049
	T-value	-1.157	-2.12	-4.476	0.316	-2.24	-1.783	-2.238	-3.784	-4.15	-2.644	-3.501
	P-value	0.248	.034*	.000***	0.752	.026*	0.075	.026*	.000***	.000***	.008**	.001**
Urban or rural origin	Urban (Mean ± SD) N=302 (55.82%)	3.51±1.024	2.38±1.114	3.66±1.034	2.23±1.114	3.19±.094	3.04±1.148	2.94±1.170	3.25±1.132	3.60±1.097	2.84±1.144	2.75±1.060
	Rural (Mean ± SD) N=239 (44.18%)	3.58±1.017	2.48±1.141	3.66±.952	2.54±1.155	3.23±1.057	3.11±1.148	3.07±1.102	3.37±1.044	3.49±1.033	2.97±1.107	2.79±1.032
	T-value	-0.848	-0.987	0.024	-3.098	-0.396	-0.788	-1.316	-1.3	1.141	-1.337	-0.431
	P-value	0.397	0.324	0.981	.002**	0.693	0.431	0.189	0.194	0.254	0.182	0.666
Educational stages	Under-graduate (Mean ± SD)	3.54±.999	2.52±1.121	3.69±.929	2.47±1.165	3.25±1.077	3.07±1.12	3.00±1.154	3.32±1.078	3.58±1.028	2.92±1.086	2.78±1.065

N=353												
(65.25%)												
Master (Mean ±												
SD)												
N=119	3.52±1.056	2.30±1.101	3.83±.951	2.24±1.104	3.16±1.041	3.2±1.086	3.02±1.058	3.34±1.091	3.61±1.01	2.97±1.175	2.78±1.026	
(22.00%)												
PhD												
(Mean ± SD)	3.55±1.078	2.16±1.146	3.20±1.267	2.03±1.00	3.04±1.194	2.84±1.171	2.94±1.223	3.13±1.187	3.30±1.332	2.67±1.245	2.71±1.001	
N=69 (12.75%)												
F-value	0.027	3.807	9.433	5.328	1.201	2.274	0.096	0.951	2.159	1.817	0.125	
P-value	0.973	.023*	.000***	.005**	0.302	0.104	0.908	0.387	0.116	0.163	0.882	

Notes: \*\*p<.01; SD=standard deviation.

**Table VIII. Variance analysis results of the mental health information needs of student groups in different mental health status (N=541)**

	Mental health status (Mean ± SD)					F-value	P-value
	Very poor n=10 (1.85%)	Poor n=38 (7.02%)	Average n=195 (36.04%)	Good n=226 (41.77%)	Very good n=72 (13.31%)		
Study stress	3.80±1.4 76	3.92±.94 1	3.65±.94 2	3.47±.99 4	3.22±1.1 78	4.18 1	.002* *
Transition to university	2.60±1.5 06	2.53±1.2 02	2.51±1.1 19	2.47±1.0 8	1.96±1.1 06	3.67 1	.006* 1
Employment pressure	4.10±1.4 49	3.89±1.0 08	3.71±.91 4	3.65±.94 1	3.33±1.2 33	3.12 7	.015* 7
Internet dependence	2.30±1.4 18	2.37±1.1 72	2.46±1.1 54	2.41±1.0 97	1.97±1.1 38	2.61 3	.035* 3
Social interactions/communications	2.3±1.33 7	3.42±1.0 56	3.38±1.0 0	3.19±1.0 46	2.81±1.2 52	6.04 7	.000* **
Intimate relationships	2.80±1.1 35	3.26±1.2 01	3.03±1.0 93	3.15±1.0 17	2.86±1.4 17	1.40 5	.231 5
Family relationships	3.40±0.9 66	3.24±1.3 84	3.20±1.0 96	2.88±1.0 91	2.61±1.1 7	5.07 0	.001* *
Mental health awareness	3.60±1.1 74	3.53±1.1 56	3.40±.94 9	3.31±1.0 93	2.82±1.3 04	4.59 5	.001* *
Self-understanding	4.00±1.0 54	3.63±1.0 76	3.56±1.0 05	3.58±1.0 35	3.36±1.3 14	1.09 4	.359 4
Emotion management	3.80±1.0 33	3.29±1.1 6	3.03±1.0 62	2.86±1.0 72	2.36±1.2 59	7.87 1	.000* **
Psychological counselling	2.60±1.5 06	3.08±1.1 71	2.94±.99 6	2.73±.97 3	2.29±1.1 19	6.33 0	.000* **

Notes: \*\*p<.01; SD=standard deviation.

**Table IX. Posteriori comparisons results of the mental health information needs of student groups in different mental health status (N=541)**

Information needs	Posteriori comparisons	F-value	P-value
Study stress	poor>very good	4.181	.010**
	poor>very good		.011*
Transition to university	average>very good	3.671	.000***
	good>very good		.001***
Internet dependence	average>very good	2.613	.002**
	good>very good		.004**

		very poor<poor		.003**
		very poor<average		.002**
	Social interactions/communications	very poor<good	6.047	.010*
		poor>very good		.004**
		average>very good		.000***
		good>very good		.009**
		very poor>very good		.038*
	Family relationships	poor>very good	5.070	.006**
		average>good		.004**
		average>very good		.000***
		poor>very good		.045*
	Mental health awareness	average>very good	4.595	.008**
		good>very good		.043*
		very poor>very good		.015*
	Emotion management	good>very good	7.871	.002**
		average>very good		.001***
		good>very good		.029*
		poor>very good		.011*
	Psychological counselling	average>very good	6.330	.000***
		good>very good		.038*

Notes: \*\*p<.01.

**Table X. Online resources to satisfy university students' mental health information needs (N=459)**

Rank	Online resource	Number	Percentage
1	Search engines	326	71.02
2	Q&A platforms	246	53.59
3	Public social media platforms	246	53.59
4	Mental health online platforms hosted in university	61	13.29
5	Online education platforms (e.g., MOOC)	56	12.2
6	Professional mental health online platforms	48	10.46
7	Digital platforms of traditional media	28	6.10
8	Digital library	23	5.01

Notes: This is the multiple-choice question; N refers to the number of people who once used the Internet to search for mental health information.



**Table XI. Knowledge of the respective university's online mental health services (N=459)**

University's online mental health services	Number	Percentage
Mental health websites	357	65.99
Social media platforms	200	36.97
Online courses	259	47.87
Others	8	1.48
None or don't know any of the above one	83	15.34

Notes: This is the multiple-choice question. N refers to the number of people who once used the Internet to search for mental health information.

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