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Master's Thesis

Improving online mental health screening with a
customized interim report to overcome mental health
literacy and privacy concerns

Yoon Heo

Department of Human Factors Engineering

Graduate School of UNIST

2020

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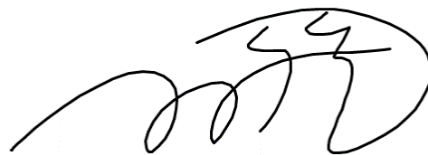
Improving online mental health screening with a customized interim report to overcome mental health literacy and privacy concerns

A thesis/dissertation
submitted to the Graduate School of UNIST
in partial fulfillment of the
requirements for the degree of
Master of Science

Yoon Heo

06. 11. 2020 of submission

Approved by



Advisor

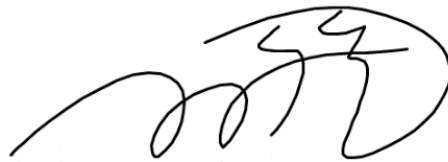
Dooyoung Jung

Improving online mental health screening with a customized interim report to overcome mental health literacy and privacy concerns

Yoon Heo

This certifies that the thesis/dissertation of Yoon Heo is approved.

06/11/2020 of submission



Advisor: Dooyoung Jung



Committee Member: Chiehyeon Lim



Committee Member: KyungHo Lee

ABSTRACT

Introduction

University student's mental health is one of the important problems because students with severe mental illness are increasing as well as many students are suffering from mental disease such as depression, anxiety disorder and eating disorder. The World Health Organization World Mental Health Surveys showed that only 6.7-23.1% of students took treatment for their mental disorders. Students are reluctant to visit the healthcare center due to barriers such as stigma, lack of awareness, lack of time, and perceived need. Awareness and perceived needs are related to Mental Health Literacy (MHL). MHL has been highlighted as a solution to the main factors of barriers to mental health services especially attitude or stigma, and help-seeking efficacies.

The service to be introduced in this study is intended to be developed with a focus on the following four aspects. First, students do not need to check one symptom, but rather to examine the comprehensive disorders. Second, it should help to enable students to self-profile and increase awareness because it visualizes the results with short comments after finishing the screening. Third, it requests to evaluate students' own mental health and compare the perceived mental health to the screening results. Lastly, students can access the screening without any personal information, which will reduce public stigma.

Methods

The screening was open January 15, 2020 for two weeks, and it was sent via Healthcare center e-mail asking UNIST students to use the screening in both Korean and English. There are four steps. The first two steps (introduction and first overall screening) are mandatory and the other steps (second advanced screening and service registration) are optional. Once the first overall screening is complete, users can apply for service or proceed with the second screening. If the user goes through the second screening process, the user can also apply for the service on the results page when the second screening is completed.

Results

A total of 189 students participated in the screening. Of 38 (20%) were excluded for two reasons. First, I excluded those who used the English version screening (27 participants) due to between the Korean and English version screening. In the English screening, there are only simple comments, but no second screening and no application link for service. Second, an item for validation is placed at the

end question of each screening e.g., PHQ-9 originally consists of 9 questions, and the last one included the question such as “Are you a man?” for validation. So, PHQ-9 was changed into 10 questions. There were 11 people who were inconsistent compared with validation question and intro page questionnaires, and they were excluded. Therefore, the analysis was conducted on 151 (79%) people who finished the basic screening. Of the 151 people, four applied for service directly and 65 used the second screening.

Discussion

The screening service checks overall mental health as a first step. Traditional online screening usually checks only one symptom, but it checks overall because lots of students have a barrier to mental health service by awareness. I assume that it is better to check overall for students who have low mental health literacy. In addition, it also can download results. The service suggests the second advanced screening and offline service registration. It also helps to resolve stigma, which is often experienced in mental health, because the screening does not request any information about privacy when using it. When each step is complete, offline services are also linked, so students will get enough information about mental health just by using the service. Forty percent of participants followed the proposed service and the reason for finishing the first overall screening was also not negative reason (83%). Furthermore, the service has even increased interest in mental health by employing ideas of similar concepts in other fields. So, the study showed that this service is valuable enough because it has created a well-founded service by adopting similar ideas from other fields.

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1. INTRODUCTION

1.1 Background

University students' mental health is one of the most important issues because the number of students with severe mental illnesses is rising (Eisenberg, Gollust, Golberstein, & Hefner, 2007; Gallagher, 2015). Many students suffer from mental diseases, such as depression, anxiety, and eating disorders (Auerbach et al., 2016). Students are more likely to be stressed than non-student groups due to drastic environmental changes (Arnett, Žukauskienė, & Sugimura, 2014). Most high school students lead their lives within routines set by their parents or schools, spending a lot of time in school from morning to evening. In contrast, when they commence their university life, they have to become more self-reliant. The new university environment can be intimidating and trigger anxiety in students. Additionally, they also become physically distant from their families and close friends since they cannot meet them often. For example, they need to plan their class schedules before the beginning of a new semester. Subsequently, they must interact with those who take classes with them for team projects and make presentations in front of hundreds of university students. It becomes more mentally difficult because they do not have the support they require since everyone is new to them. As a result, many students are likely to face difficulties adjusting to college life and suffer mental illnesses, such as depression, anxiety, and so on. Inability to receive timely and appropriate mental health care negatively impacts not only their relationships and social functions, but also their academic performance (Eisenberg, Gollust, et al., 2007; R. C. Kessler, Walters, & Forthofer, 1998).

1.2 Campus Healthcare Center

There are many advantages to on-campus healthcare centers (also called counseling centers), as they are not only accessible, but also available for free because they are within the university campus. Hence, students can visit the center between or after classes. Students are taking positive attitudes with interest in mental health a little (Vidourek & Burbage, 2019). Previous research shows that 97% of the respondents were satisfied or very satisfied with campus counseling services, and 96% answered positively to a question regarding revisit (Saunders & House, 2015). Considering many students visit the healthcare center on their friends or professors' recommendation, the center takes appropriate action from the student's perspective.

The World Health Organization World Mental Health Surveys showed that only 6.7-23.1% of students sought treatment for their mental disorders (Auerbach et al., 2016). Students are reluctant to visit healthcare centers due to mental health service-related barriers, such as stigma, lack of awareness, lack

of time, and perceived need (Blanco et al., 2008).

Previous studies investigated why students do not utilize mental health services (Eisenberg, Golberstein, & Gollust, 2007). “Stress is normal in college/graduate school” was the highest at 51%, followed by “have not had any need (45%),” and “the problem will get better by itself (37%).” The problems of cost and availability have been solved to a large extent by establishing healthcare centers within the campus because the students quoted financial constraints (8%) and inconvenience of location (2%) as reasons. However, structural barriers to using mental health care services still include financial reasons and availability for the general population (Marsh & Wilcoxon, 2015). This makes students’ mental health more severe and chronic, also preventing early interventions. This should be solved by promoting students’ awareness of mental health.

Further, UNIST Healthcare Lab conducted a student survey related to barriers when using mental health services. Figure 2 shows the results in detail. The survey results were analyzed by dividing students into three groups: campus service experience group (CSE), non-experience group (NE), and other experience group (OE). Public stigma and lack of awareness were the biggest barriers to using mental health care services for the NE. This implies that self-awareness and attitude towards mental health remain problems that need to be solved.

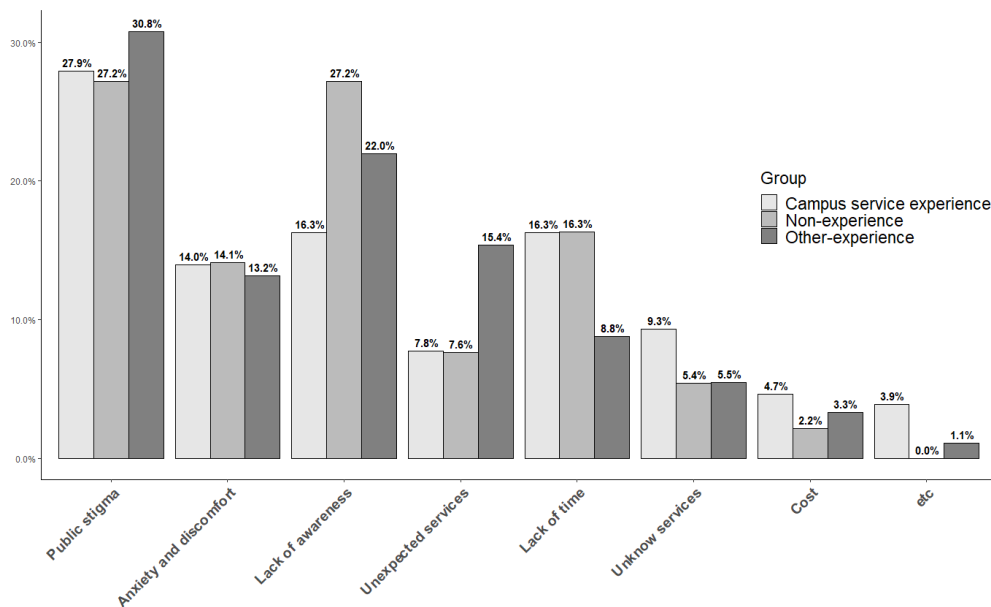


Figure 1. Response rates of barrier in UNIST students

1.3 Mental Health Literacy

Awareness and perceived needs are related to Mental Health Literacy (MHL) (Berkman, Sheridan, Donahue, Halpern, & Crotty, 2011). MHL has been highlighted as a solution to the main barriers to mental health care services, especially attitude or stigma and help-seeking efficacies (Jorm, 2000). Previous research showed that low MHL is associated with not only poorer health outcomes, but also poorer use of health care services (Berkman et al., 2011). MHL originally referred to “knowledge and beliefs about mental disorders which aid their recognition, management or prevention (Jorm, 2012).” The definition expanded to include “how to prevent a mental disorder, recognition of disorders when developing, knowledge of effective self-help strategies for mild-to-moderate problems, and first aid skills to help others (Kutcher, Wei, & Coniglio, 2016).” Improving MHL does not imply studying mental disorders but recognizing our overall mental health status. Diagnosing illnesses and prescribing medicines is part of the expertise, and the students’ role is to understand their overall mental health. Therefore, the reasons for promoting MHL are related to recognizing overall mental health status. Self-profiling is a fundamental step towards this. Additionally, MHL is related to early interventions (Kutcher et al., 2016). This should have a positive impact on students’ mental health. Therefore, on-campus healthcare centers need tools that are easily accessible to students and can efficiently solve the problems of mental health-related services by improving MHL.

1.4 Online Survey & Screening

Online screening is a way to solve these problems such as lack of awareness and public stigma (Andersson, 2018). Online screening is not only equally valid as a screening method when self-administered as against being clinically administered, but is also time-efficient (Harris et al., 2016). Researchers have been using online surveys for research, such as investigating reasons for visiting the healthcare center and screening purposes (Andersson, 2018). Healthcare centers also use online screening (survey) to ascertain students’ mental health within the campus.

Various studies are conducted along with campus healthcare centers to improve the mental health of college students. Practice-oriented research (POR) and practice and research network (PRN) have become a consistent trend in mental health research (Xiao et al., 2017). The study of mental health services does not end up as research but as a study that can be applied by a real counseling center. Institutions such as the Center for Collegiate Mental Health (CCMH) and The Centre for Innovation in Campus Mental Health were established for the development of campus healthcare centers as a type of PRN. For example, the goal of CCMH is to integrate information obtained through each counseling center and generate meaningful data. CCMH collects data through surveys from both students and counselors who they serve and treat (Hayes, Locke, & Castonguay, 2011). Data collection usually are conducted through surveys in the field of mental health.

However, there are two disadvantages of survey-based research when being used as mental health screening. First, participants are unable to see the results of screening immediately after the screening. Thus, students might develop a negative perception about mental health-related services considering online screening as being time consuming, devoid of benefits, and without rewards for screening. Many college students are tired of online surveys due to the raffle-style rewards. This is called survey fatigue (Van Mol, 2017). Second, it is not possible to suggest additional activities based on the screening results. For example, if the emotional screening results are higher than the critical point, screenings related to emotions for improving the MHL must be recommended. It is efficient to suggest additional actions, such as mental health services application because the motivation for using the services improves after viewing the screening results.

Cornell and Stanford Universities are some of the universities that actively utilize online screening. Figure 2 shows the main screening page of both these universities. Students can use screening services related to their symptoms, like depression. Completion of a screening yields a simple intervention.

However, there are several problems regarding online screening used in campuses. First, only one symptom is associated with a screening on some university screening pages. Students have to keep going back and forth on the web page if they want to check the overall symptoms. It is difficult for them to integrate each result and receive insights because it does not show their overall mental health status. It only provides a brief intervention about a particular symptom (Kutcher et al., 2016). Second, screening promotes self-awareness of mental health. However, there is a possibility that it does not. Results are only shown through text. Text-only or table information can reduce students' readability. It is necessary to show results not only as text, but also as visual materials (Pandey, Manivannan, Nov, Satterthwaite, & Bertini, 2014). Visualized data can motivate students to use mental health-related services and change their attitude (Pandey et al., 2014). Finally, it is not directly linked to the healthcare centers. If students want to apply for counseling services, they have to call the center or visit in person, which may not be feasible. Although online screening is helpful in promoting the MHL, it needs more modifications.

Need help now? Text "START" to 741-741 or call 1-800-273-TALK (8255)

Result:

You are at moderate risk for health and other problems from your current pattern of opioid use.

Taking this self-assessment is an important first step in your self-care. It gives you tools to recognize problems you may be experiencing and what can be helpful in addressing them.

You are at moderate risk of health and other problems from your current pattern of use. Continuing to use opioids as they are currently being used indicates a likelihood of future health and other problems. Risk is increased for those with a past history of substance use related problems.

You are not alone. No matter who you are or what problems you are struggling with, hurting yourself is not the answer. To seek help as soon as possible, contact the following resources:

In the United States:

- Call the National Suicide Prevention Lifeline at 1-800-273-TALK (8255)
- Text ACT to 741741 to reach the Crisis Text Line
- If this is an emergency, dial 911 or go to your nearest emergency department

In Canada:

- Call Crisis Services Canada at 1-833-456-4566 or text START to 45645
- Text HOME to 868888 to reach the Crisis Text Line
- If this is an emergency, dial 911 or go to your nearest emergency department

Self Evaluator: Results

Your Results

Thanks for taking the time to be proactive about your emotional health by taking our screening. It's important to remember that this screening isn't a diagnosis, but just identifies some common mental health conditions that MAY be impacting your thoughts, feelings or behaviors. All of these conditions are treatable, so it's important to speak to a counselor or other mental health professional so you can get help if needed and feel better.

Based on how you answered the questions, you are showing signs or symptoms often associated with the following conditions or problems:

- **Suicidal with Major Depression**

You'll find more information below about each of these conditions.

Identifying potential problems and reaching out for help is part of being an effective student. Information on your campus resources is available on the right side of this page. Don't be afraid to make an appointment. You can print out this page to take with you to help start the discussion with your counselor.

If you or someone you know are abusing drugs or alcohol to cope with your feelings, or are having thoughts of suicide, text START to 741-741, or call 1-800-273-TALK (8255) anytime for a confidential conversation with a counselor on ways to help yourself or a friend.

The Self Evaluator, while evidence-based, is for informational and educational purposes only and is not intended to constitute medical advice or be a substitute for professional diagnosis and treatment.

Figure 2. University online screening

1.5 Goal

This study aims to develop and apply responsive online screening to improve mental health literacy and decrease stigma. The service introduced in this study is intended to be developed with a focus on the following four aspects. First, students do not need to check one symptom but rather examine comprehensive disorders. By examining the overall mental health, students can know their mental health status (Kutcher et al., 2016). That is why it is hard to know what needs to be checked if students have low MHL. For example, when a student conducts a sleep screening because he or she cannot sleep, there is a possibility that the student might be suffering from depression. By checking the overall mental health status, they get to know themselves better. Second, it should enable students to self-profile and increase awareness because it visualizes the results with short comments post screening. Traditional screenings do not show such visuals of the results. Web-based screening and brief interventions are effective for students (Kypri et al., 2014). This combined with brief interventions will motivate students to use mental health-related services. Hence, it not only recommends other new screenings based on the results, but also a healthcare center service registration. It will promote the use of mental health care services and change attitudes toward mental health (Pandey et al., 2014). Since the screening tool is linked to the healthcare center, the students will be contacted when they apply for the service. Third, it requests students to self-evaluate their mental health and compare their perceived mental health status to the screening results. Comparing the results enables students to improve their mental health literacy. Lastly, students can access the screening without providing any personal information, thus reducing

public stigma.

2. Methods

This study aimed to improve students' mental health literacy using online screening that enables students to self-profile, improve MHL, and improve their help-seeking behavior. It can check their overall metal health, and then recommend other screenings based on the first overall screening results so that they can learn more about their mental health status. Additionally, if they believe that their condition is severe and agree with the results, they can register for the offline service since it is directly linked to the healthcare center's services.

The screening commenced on January 15, 2020 and continued for two weeks. It was sent via Healthcare center e-mail to UNIST students requesting them to undergo the screening provided in both Korean and English. The email contained information about what students can learn about, how is it different from the traditional method, and the time it takes (Figure 3).

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 감사합니다.

Figure 3. Invitation mail

2.1 Development

Figure 4 shows simple architecture. There are three parts: end-user, web, and server. End-users include students and admin. Students access the web page, conduct the screening, and receive the results. Administrators access the admin page and download the screening-related data.

The screening is based on the web environment, and used HTML 5, CSS, and JavaScript were used to develop the front-end. Screening scores were calculated through JavaScript. Several open sources were used for development. First, range bar open source rangelslider.js was used to receive sensitivity on the introduction page, which enhanced the ease of input. Second, the notification library sweetalert2 was used for the survey assessment. The notification window was displayed to help the step-by-step evaluation. Finally, Highcharts was used for data visualization, which visualizes data in various ways.

Amazon Web Service (AWS) was used as a server, especially Ubuntu 16.04 LTS. The type of instance was t2.micro, which is free tier. AWS is currently the largest server company with many developers using it and its security is considered the best. Helmet library was used, and the author procured an HTTPS certificate for free from Let's Encrypt for security. Node.js was used for back-end API, and it supports JavaScript. There are three reasons why Node.js was used as the back-end. First, it is a JavaScript runtime environment. Hence, the productivity is good because front-end and back-end languages are the same. Second, it uses a non-blocking I/O system. It can be easily processed despite many simultaneous connections. Finally, it supports massive libraries and API. Express was used as a framework to use middleware and routing. MySQL was used as a database. That is why it is free and easy to connect to express and Node.js.

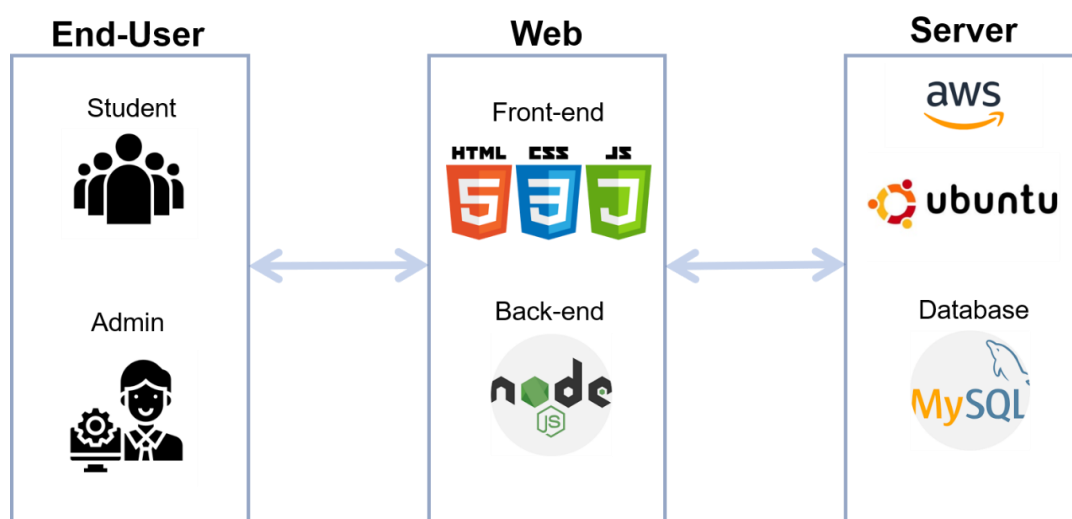


Figure 4. Simple architecture

2.2 Healthcare Center Counselors' Feedback

Before commencing the screening, the author received feedback from four healthcare center counselors. There was similar feedback, so it was calculated in one piece. Feedback was classified into three categories: contents, function, and UI/UX. Contents consisted of typing errors, the latest leaflet, data related to the healthcare, such as changing the word “procrastination” to “delaying behavior,” hoping to write down both the self-assessment and actual score in detail. Functional feedback contained a significant amount of validation. For instance, when all questions are checked with the same number, a warning message should be displayed. UI/UX feedback was mostly related to color and layout. For example, a counselor commented, “It is better to emphasize actual scores than perceived mental health score in the result visualization?”

Table 1. Categorizing counselors' feedback

	First Feedback	Second Feedback	Total
Contents	10	18	28
Function	4	0	4
UI/UX	6	5	11
Total	20	23	43

2.3 Process

Figure 4 shows the overall process in detail. There are four steps. The first two steps (intro and first overall screening) must be carried out and the remaining two (second screening and service request) can be carried out if the user so wishes. Once the first overall screening is completed, the user can apply for a service or proceed with the second screening. If the user goes through the second screening process, he/she can also apply for the service on the results page after completing the second screening. Additionally, by providing a health center leaflet, users will know about the various services offered by the healthcare center.

2.3.1 Introduction Page

Before the screening begins, students can choose between the English and Korean versions. There are three categories on the introduction page: demographics, sensitivity, and checking perceived mental health. There are three sections to the demographic question: age, sex, and degree. Degree courses consist of undergraduates, masters, PhDs, and others. Sensitivity consists of three questions regarding the users' sensitivity about entering an email addresses, phone numbers, and demographic details. E-

mail addresses and phone numbers are specific information, and the author believe that the majority would be more sensitive when entering their phone numbers. I would like to compare the two input sensitivity differences since these may be related to the use of mental health-related services. Many students have a stigma against mental health. Therefore, I would like to find out how sensitivity to entering demographic information interferes with additional behavior. Email and phone-related questions range from 0 to 10 points; the demographic-related question is scored on a 4-point Likert-scale (1=Very repulsive to 5 =Never repulsive). The last category is about checking one’s own perceived mental health level. The questions are related to the first overall screening. Thus, there are 7 questionnaires along with the overall mental health assessment. Figure 5 shows the input form. It has questions that evaluate one’s mental health by matching each screening questionnaire to ask how much one knows about one’s mental health. For example, “I am depressed” is related to depression, and it will visualize the result compared to the PHQ-9 questionnaire. I set the score range to equal the one matching each screening. This perceived mental health assessment will visualize and compare the actual screening results on the feedback page.

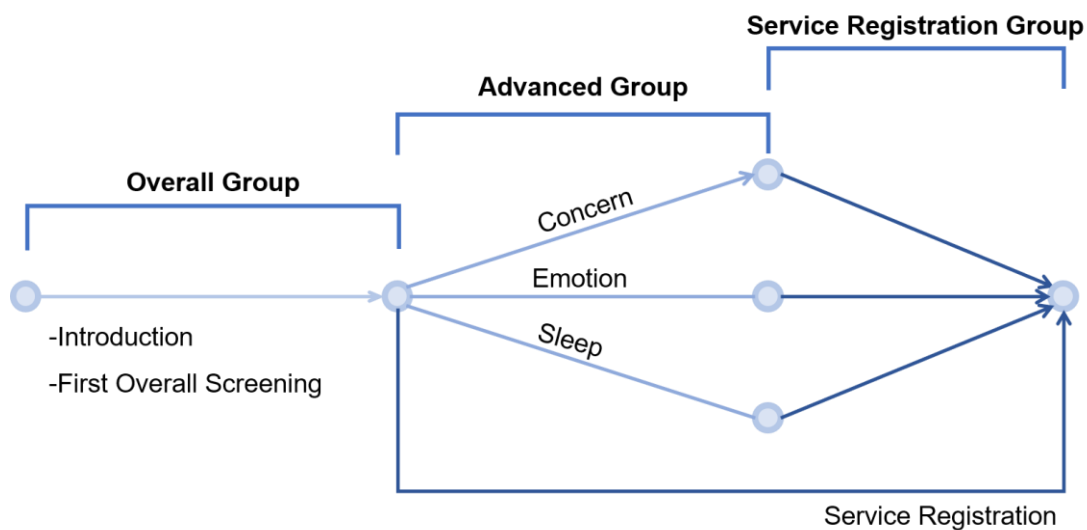


Figure 5. Overall process

2.3.2 Process of Change on Introduction Page

There are two major changes on the introduction page. On seeing the page, I tried to reduce the chunk rate when users use the service because I want them to see without any inconvenience such as stigma. Hence, I got some feedback from various groups, psychiatrists, PhD in psychology, students, and healthcare center counselors. First, I hid the writing through the button, so users can see the guide

comment and contact information by clicking the folding button, because one of the points in the feedback indicated a lot of writing on this page. Second, I changed the words. That is because some words can create a stigma, such as “mental health.”

아래 질문에 슬라이더를 조절하여 답해주세요.

내 정신건강을 잘 알고 있다.

아니다 그렇다
점수: 0%

주의가 산만하다.

아니다 그렇다
점수: 0%

지나치게 완벽함을 추구하다가 일을 느르친다.

아니다 그렇다
점수: 0%

할 일을 몰아서 한다.

아니다 그렇다
점수: 0%

잠 잘 때 불편하다.

아니다 그렇다
점수: 0%

나는 우울하다.

아니다 그렇다
점수: 0%

나는 불안하다.

아니다 그렇다
점수: 0%

1 / 7 다음

Figure 6. One’s own perceived mental health input form

나의 정신건강 알아보기
(집중력, 완벽주의/시간관리, 수면, 정서)

kor eng

If you can't understand korean, you just click eng button upper right slide.

안녕하세요! 구성원들의 마음 건강을 위해 노력하고 있는 울산과학기술원 헬스케어센터입니다. 헬스케어센터에서 마음건강관리를 위해 '자신의 상태'를 알아보기 위한 설문지를 준비했습니다. 설문 결과를 바탕으로 더 구체적인 도움을 제공할 수도 있고, 헬스케어센터에서 필요한 서비스를 알릴 수도 있습니다. 아래 안내사항을 읽어보시고 순서에 따라 참여해주세요.

안내

1. 자신의 결과를 확인하고 저장할 수 있습니다.
2. 본인 의지에 따라서 시작하고 중단할 수 있습니다.
3. 예상 소요시간은 20 ~ 25분입니다.
4. 문의 연락처는 다음과 같습니다.

- 임상심리전문가 이유경 (052-217-4011)
- 임상심리전문가 & 심리학박사 이상일 (052-217-2742)
- 기술 문의 헬스케어연구실 (052-217-2742)

동의 1. 개인정보 수집 목적 (정신 건강 증진을 위한 연구/분석) 및 항목 (설문 결과), 그리고 개인정보처리에 대한 안내에 동의하십니까?

동의합니다.

개인정보 1. 당신은 어떤 학위과정 중입니까?

학사과정(대학)

석사 또는 통합 4학기 이하

박사 또는 통합 5학기 이상

기타

개인정보 2. 당신의 성별은 무엇입니까?

여성

남성

개인정보 3. 출생년도를 입력해주세요.

예) 1991

위 개인정보(학위, 성별, 출생년도)를 입력하는 것에 대해서 어떻게 느꼈습니까?

거부감이 매우 크다

거부감이 조금 크다

나의 정신건강 알아보기
(집중력, 완벽주의/시간관리, 수면, 정서)

kor eng

안내사항 열리기 ▼

동의 1. 개인정보 수집 목적 (정신 건강 증진을 위한 연구/분석) 및 항목 (설문 결과), 그리고 개인정보처리에 대한 안내에 동의하십니까?

동의합니다.

개인정보 1. 당신은 어떤 학위과정 중입니까?

학사과정(대학)

석사 또는 통합 4학기 이하

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예) 1991

위 개인정보(학위, 성별, 출생년도)를 입력하는 것에 대해서 어떻게 느꼈습니까?

거부감이 매우 크다

거부감이 조금 크다

헬스케어센터 마음건강 스크리닝
(집중력, 완벽주의/시간관리, 수면, 정서)

eng

안녕하세요!
마음 건강을 위해 노력하고 있는 헬스케어센터입니다.
자신의 상태를 알아보기 위한 설문지를 준비했습니다.

안내 열리기 ▼

동의 1. 개인정보 수집 목적 (정신 건강 증진을 위한 연구/분석) 및 항목 (설문 결과), 그리고 개인정보처리에 대한 안내에 동의하십니까?

동의합니다.

1. 당신은 고대 헬스케어센터를 이용한 경험이 있습니까?

네

아니요

2. 당신은 어떤 학위과정 중입니까?

학사과정(대학)

석사 또는 통합 4학기 이하

박사 또는 통합 5학기 이상

기타

3. 당신의 성별은 무엇입니까?

여성

남성

4. 당신의 출생년도를 입력해주세요.

예) 1991

5. 위 개인정보(학위, 성별, 출생년도)를 입력하는 것에 대해서 어떻게 느꼈습니까?

거부감이 매우 크다

거부감이 조금 크다

Figure 7. Intro change process

2.3.3 First Overall Screening Questionnaires

There are six screening questionnaires in the first overall screening: Adult ADHD Self-Report Scale (ASRS) (Ronald C Kessler et al., 2005), Multidimensional Perfectionism Scale (FMPS) (Hewitt, Flett, Turnbull-Donovan, & Mikail, 1991), Aitken Procrastination Inventory (Aitken, 1983), Adolescent Sleep Hygiene Scale (ASHS) (Tan, Healey, Gray, & Galland, 2012), Patient Health Questionnaire-9 (PHQ-9) (Kroenke, Spitzer, & Williams, 2001), and the Generalized Anxiety Disorder-7 (GAD-7) (Löwe et al., 2008). The ASRS, FMPS, and API are constructed in the form of five-point scales (1-5), ASHS is a seven-point scale (0-6), and PHQ-9 and GAD-7 are presented on a four-point scale (0-3). The combination of these questionnaires was based on Research Domain Criteria (RDoC). Figure 6 shows the RDoC category. There are three classification frameworks in the field of mental health: DSM, ICD, and RDoC. A previous paper defined it as follows (Clark, Cuthbert, Lewis-Fernández, Narrow, & Reed, 2017): “A primary goal of the RDoC is to develop a classification system for mental health based on dimensions of observable behavior and neurobiological measures, rather than symptom complexes based largely on clinical descriptions which form the basis of the diagnostic and statistical manual of mental disorders (DSM) and the International Classification of Diseases (ICD)”. RDoC was used instead of DSM and ICD because RDoC was considered more suitable since it was designed to classify the overall symptoms. “Negative valance” is related to PHQ-9 and GAD-7, which is a tool used to screen depression and anxiety. “Positive valance” is related to FPMS, which is a tool used to screen perfectionism. “Cognitive” is related to ASRS, which is a tool used to screen adult ADHD. “Social” is related to API which is a tool used to screen procrastination. “Arousal and Regulation” are related to ASHS, which is a tool used to screen the quality of sleep. Table 1 shows how the matching is done and the other information in detail.

Table 2. Questionnaires construction based on RDoC

Category	Screening	# of items	Disease	Scale
Negative valance	PHQ-9 & GAD-7	9 and 7 items	Depression & Anxiety	Four-point scale; 0 = Not at all sure, to 3 = Nearly every day
Positive valance	FMPS	35 items	Perfectionism	Five-point scale; 1 = Strongly Disagree, to 5 = Strongly Agree
Cognitive	ASRS	19 items	Adult ADHD	Five-point scale; 1 = Never, to 5 = Very Often
Social	API	18 items	Procrastination	Five-point scale; 1 = Strongly Disagree, to 5 = Strongly Agree
Arousal & Regulation	ASHS	35 items	Quality of sleep	Six-point scale; 1 = Never, to 6 = Always

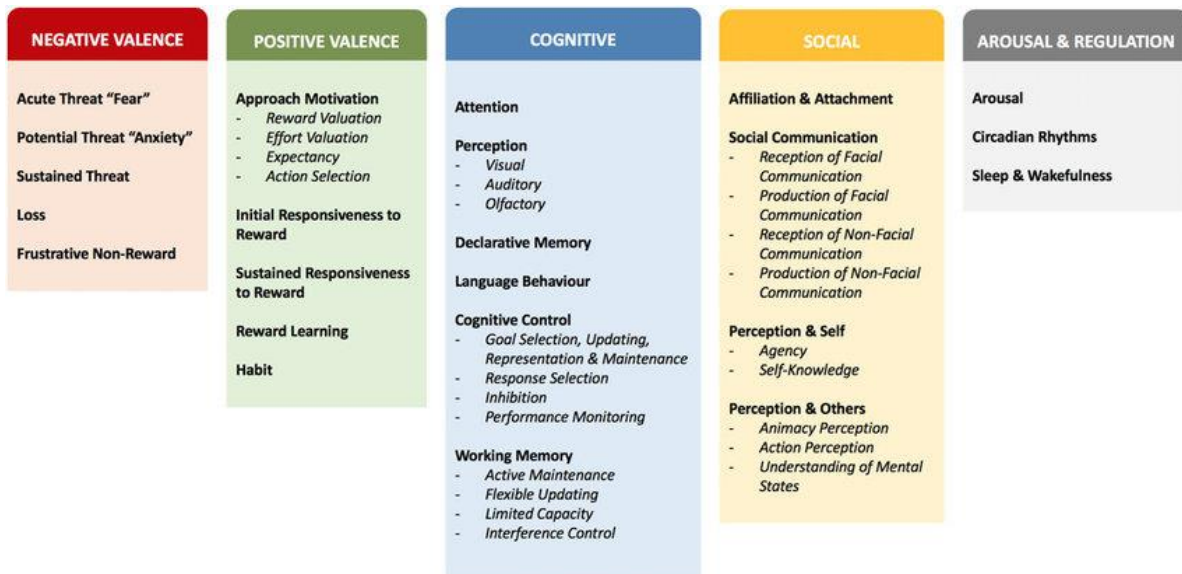


Figure 6. Overview of the research domain criteria (RDoC)

2.3.4 Second Advanced Screening Questionnaires

The participants are asked their reason for choosing this before commencing the second advanced screening. There are three categories in the second advanced screening questionnaires: concern, emotion, and sleep. "Concern" consists of two questionnaires: the Metacognition Questionnaire-30 (MCQ) and the Penn State Worry Questionnaire (PSWQ) (O'Carroll & Fisher, 2013). "Concern" is related to ASRS, FMPS, and API. A student with a risk score in the three questionnaires will be shown the concern-related questionnaires. "Emotion" also has two questionnaires: the Beck Anxiety Inventory and Beck Depression Inventory (BDI) (Tagalidou, Baier, & Laireiter, 2019). It is related to the PHQ-9 and GAD-7. It has the same pattern as "concern." Lastly, "sleep" consists of only the Pittsburgh Sleep Quality Index (PSQI) (Backhaus, Junghanns, Broocks, Riemann, & Hohagen, 2002). If the student shows normal levels in all areas except sleep, the screening will recommend the sleep screening. The BAI and BDI are constructed in the form of 4-point scales (0-3), MCQ and PSQI are also 4-point scales with scores ranging from 0 to 3. PWSQ is presented on 5-point scales (1-5).

2.3.5 Service Registration

Service registration is available when the first overall screening or second advanced screening is completed. The applicant fills out the specified input form. The input form is provided in detail in Figure 4. The input form requests the name, contact number, availability for a visit to the healthcare center,

and the reason for the request. Entering the name, phone number, and availability is mandatory, but the reason for visiting the healthcare center, which is last item, can be left blank when submitting the request. This form is very similar to the existing healthcare forms. Once the required information is entered, an email is sent to the healthcare center with survey results and request-related information. If the screening results are higher than the risk score, score colors are changed to red with “risk area.”

Table 3. The questionnaires based on the first overall screening

Category	Advanced Screening	# of items	Score	First Screening
Concern	MCQ	30 items	4-point scale: 1 = Strongly Disagree to 4 = Strongly Agree	ASRS, FMPS and API
	PSWQ	16 items	5-point scale: 1 = Not at all typical to 5 = Very typical of me	
Emotion	BAI	21 items	4-point scale: 0 = Not at all to 3 = Severely	PHQ-9 and GAD-7
	BDI	21 items	4-point scale: 0 to 3 scale for each question	
Sleep	PSQI	10 items	4-point scale: 0 = Not during the past month (No problem) to 3 = 3 or more times a week (A very big problem)	ASHS

2.3.5.1 Results Page

When the first overall screening or second advanced screening is complete, the results are visualized with brief comments, such as “Why don’t you pay more attention to certain areas.” A detailed example is shown Fig 5. The title shows users the name of the screening and what kind of disorders it is associated with. The participants can easily ascertain whether they are in a clinically hazardous area by marking the risk area. The self-assessment conducted on the introduction page was visualized by comparing the actual results. The results can be saved in excel, pdf, and png formats. There are three possible options: terminating without any additional action, using second advanced screening, and service registration.

헬스케어센터 신청서

아래의 질문을 작성해주세요.
2일 내(주말,공휴일 제외)로 연락이 없는 경우 052)217-4011로 연락 주시기 바랍니다.

※ 유의사항
아래의 신청서는 간편하게 하기 위한 최소한의 정보를 요청드리고 있습니다.
이에 더 자세한 정보 수집을 위해서 이후에 별도의 정식 신청서 작성을 안내드릴 예정입니다.

1. 이름을 입력해주세요.

예) 김아무개

2. 전화번호를 입력해주세요.

예) 01012345678

3. 방문 가능한 요일을 알려주세요.

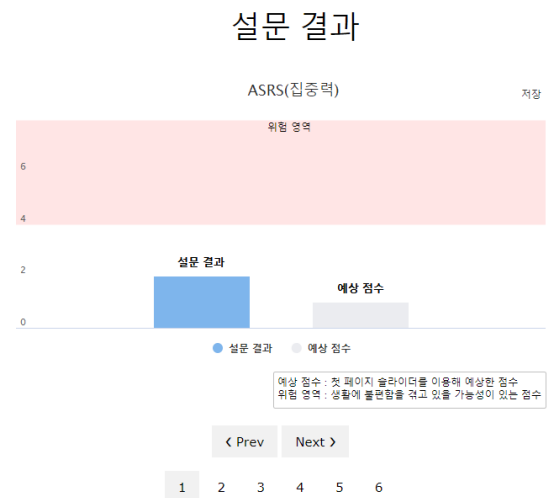
예) 월요일, 수요일

4. 신청 이유에 대해 알려주세요.

60자 이내로 적어주세요

신청서 제출하기

Figure 7. Input request form



집중력, 시간관리, 수면점수가
위험 점수보다는 낮지만 예측보다 더 불편함을 겪고 있는 것으로 보입니다.
더 관심을 가져 보는 건 어떨까요?

잊박주의, 우울, 불안 점수가
위험 점수 보다 높게 측정되어 일상생활에서 불편함이 발생할 수 있습니다.
더 자세한 본인의 상태를 알아보기 위해서 아래 추천된 2차 설문이나
유니스트 헬스케어센터에 방문하셔서 전문가와 상의해 보는 건 어떨까요?

Figure 8. Feedback page

2.3.5.2 Process of Change on Results Page

There are several changes in the results page. There are three bars: actual screening, perceived mental health, and clinical criteria in the first version. The bars also show the scores. I changed the clinical criteria from the bar to a red dotted line. I received feedback stating that it was difficult to recognize the clinical criteria. There are also some comments stating that participants did not understand names, clinical criteria, and perceived score. To address these, I added a description in the bottom left as a legend. In the third version, I also changed the clinical criteria to a yellow area to understand the clinical criteria more intuitively. I received some more feedback. I labeled the name on the bar, actual screening, and perceived score. I changed the save hamburger button to text because students did not know the function of saving the visualization. Yellow criteria did not convey the severity and hence, I changed the color to red. Finally, I received feedback from the counselors claiming that the actual screening was more important, which must be emphasized on. As a result, I changed the bar colors to blue and gray.

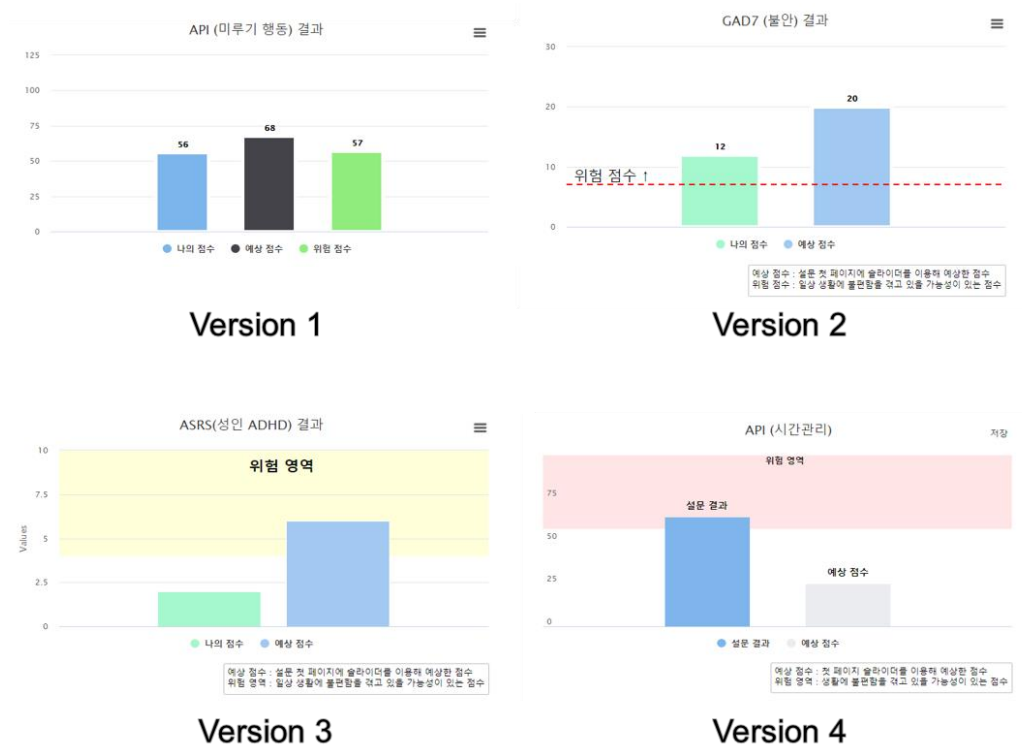


Figure 9. Data visualization change process

3. Results

A total of 189 students underwent the screening (Fig. 9). Of these, 38 (20%) were excluded for two reasons. First, I excluded those who used the English version of the screening. There are differences between the Korean and English versions. In the English version, there are only simple comments without second advanced screening and an application link for service. This is because the healthcare center currently has only one professional person who can conduct counseling in English. Thus, the 27 participants who used the English screening were excluded. Second, an item for validation is placed as the last question of each screening. For instance, PHQ-9 originally consists of nine questions, and the last one included question, such as “Are you a man?” for validation. Hence, PHQ-9 was changed into 10 questions. There were 11 people whose responses were inconsistent compared to the validation question and introduction page questionnaires, and they were excluded. Therefore, the analysis was conducted on 151 (79%) students who finished the first overall screening. Of these, 4 applied for service directly, 65 used the second advanced screening, and 3 out of 65 students who used the second advanced screening applied for a service. I divided the participants into three groups: overall group, second advanced group, service registration. Overall included those who only finished the first overall screening. Advanced included those who took the second advanced screening. Service registration included those who applied for service. Data were analyzed through descriptive statistics, t-test, and analysis of variance (ANOVA). Post-hoc test, which is Scheffe analysis was used to compare for each group, first overall, second advanced and service registration group.

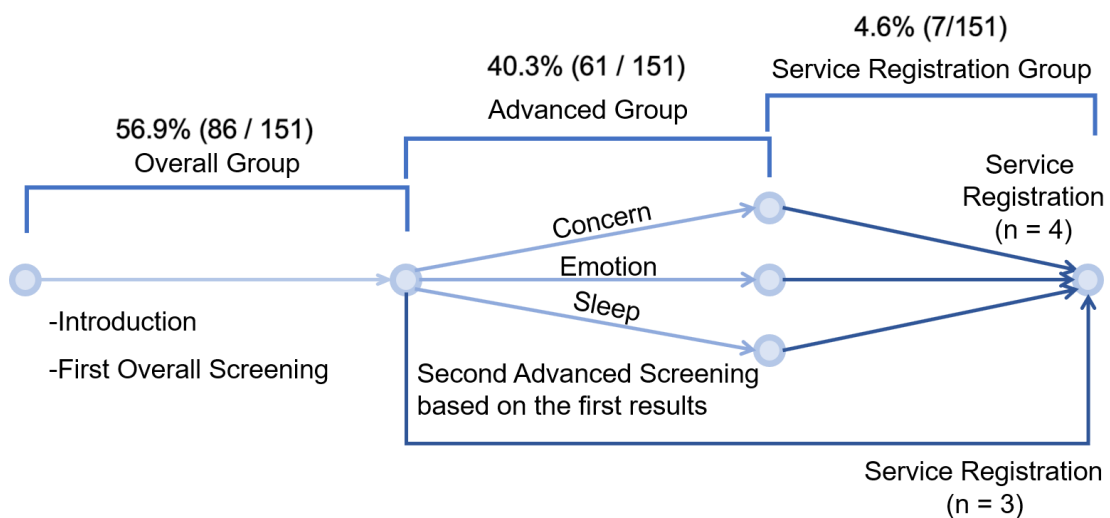


Figure 10. Result diagram

3.1 Screening Score

3.1.1 Actual Screening Results

Figure 10 shows the actual screening results. The mean was 2.51 (SD = 1.57) for ASRS, 109.82 (SD = 17.8) for FMPS, 54.43 (SD = 13.12) for API, 4.38 (SD = 0.51) for ASHS, 7.09 (SD = 4.47) for PHQ-9, and 4.92 (SD = 4.09) for GAD-7. In the overall group, the mean was 2.41 (SD = 1.58) for ASRS, 108.3 (SD = 17.5) for FMPS, 52.99 (SD = 13.1) for API, 4.41 (SD = 0.51) for ASHS, 6.65 (SD = 4.61) for PHQ-9, and 4.61 (SD = 3.89) for GAD-7. In the advanced group, the mean was 2.58 (SD = 1.55) for ASRS, 111.75 (SD = 18.48) for FMPS, 55.12 (SD = 13.7) for API, 4.37 (SD = 0.46) for ASHS, 7.7 (SD = 4.15) for PHQ-9, and 5.18 (SD = 3.89) for GAD-7. In the service registration group, the mean was 3.14 (SD = 1.77) for ASRS, 112.42 (SD = 16.23) for FMPS, 66.57 (SD = 11.05) for API, 4.25 (SD = 0.79) for ASHS, 7.42 (SD = 5.34) for PHQ-9, and 6.42 (SD = 6.42) for GAD-7. There were some differences in the results, which showed API as being statistically significant ($p < .05$, F-value = 3.725). The results of post-hoc test showed that the mean of the service registration group was significantly higher than the overall group ($p < 0.05$).

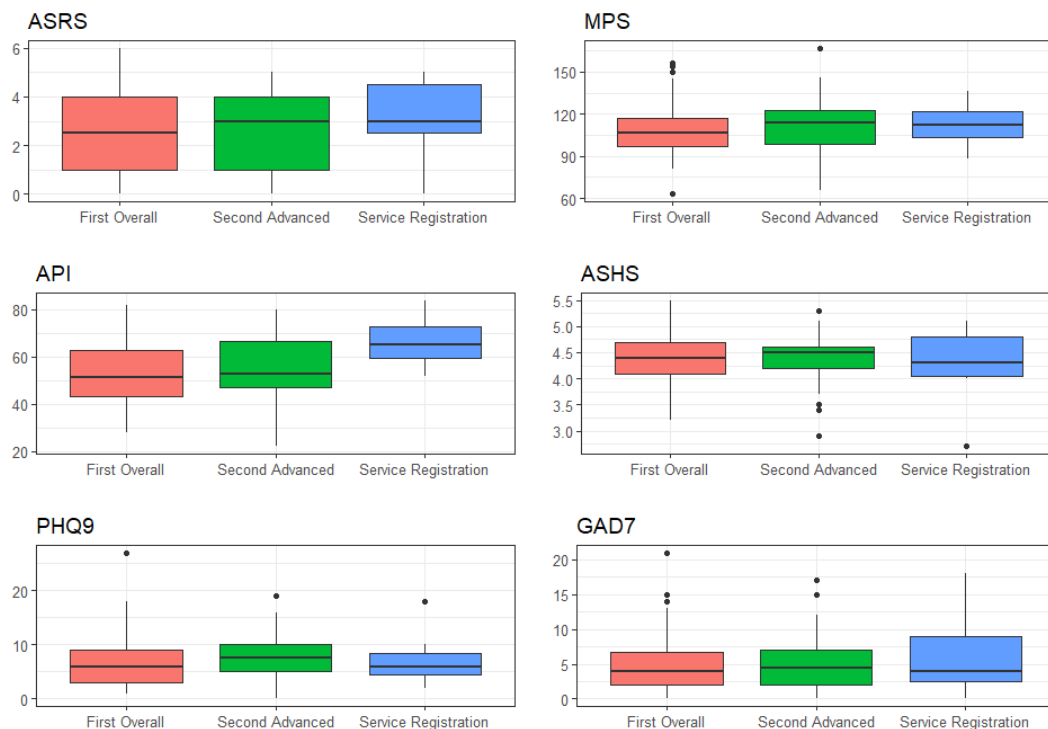


Figure 11. Actual screening results

3.1.2 Perceived Mental Health Score

Figure 11 shows the perceived mental health results. The total indicated that the mean was 2.91 (SD = 1.76) for ASRS, 102.6 (SD = 46.14) for FMPS, 56.39 (SD = 27.52) for API, 3.48 (SD = 1.87) for ASHS, 11.99 (SD = 8.04) for PHQ-9, and 10.96 (SD = 6.54) for GAD-7. In the overall group, the mean was 2.84 (SD = 1.78) for ASRS, 101.69 (SD = 43.3) for FMPS, 52.15 (SD = 27.96) for API, 3.57 (SD = 1.91) for ASHS, 11.49 (SD = 8.13) for PHQ-9, and 10.44 (SD = 6.38) for GAD-7. In the advanced group, the mean was 2.98 (SD = 1.8) for ASRS, 103.98 (SD = 49.29) for FMPS, 60.58 (SD = 26.34) for API, 3.44 (SD = 1.85) for ASHS, 12.51 (SD = 8.24) for PHQ-9, and 11.13 (SD = 6.78) for GAD-7. In the service registration group, the mean was 3.14 (SD = 1.46) for ASRS, 102.42 (SD = 59.62) for FMPS, 73.71 (SD = 21.93) for API, 2.71 (SD = 1.74) for ASHS, 13.85 (SD = 4.84) for PHQ-9, and 16 (SD = 4.79) for GAD-7. There were some differences in the results, which showed API as being statistically significant ($p < .05$, F-value = 3.17). The results of post-hoc test showed no statistically significant difference.

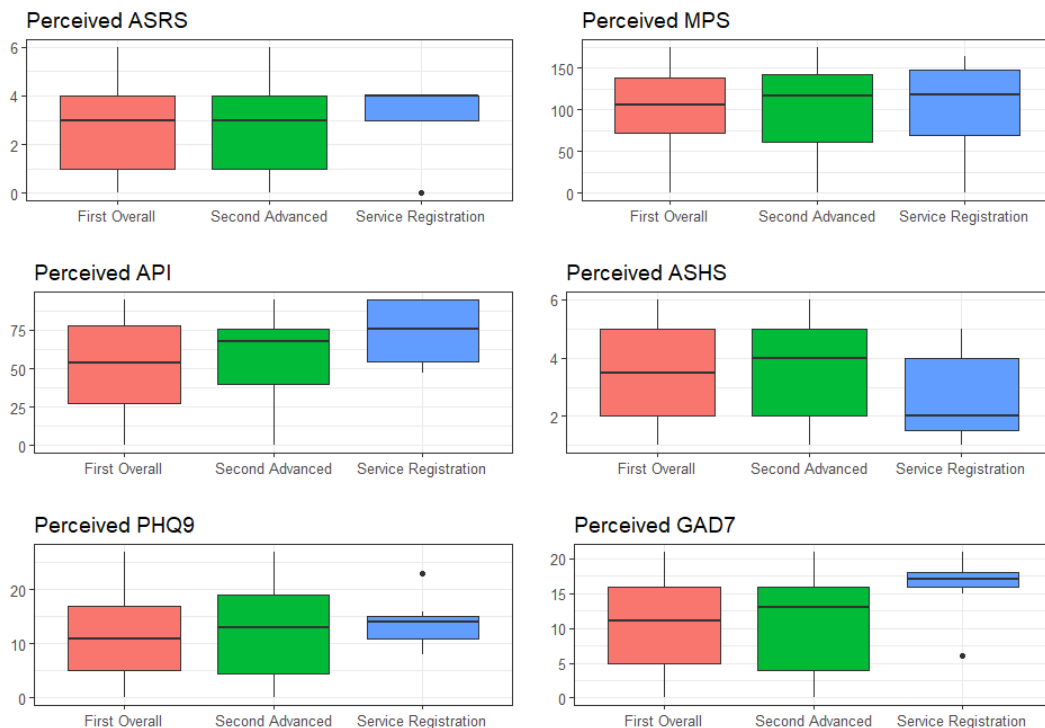


Figure 12. Perceived mental health scores

3.1.3 Compare Perceived Mental Health with Actual Screening

In mental health, each culture shows a different distribution of screening results. Therefore, it is necessary not to estimate by absolute but to categorize as the overall group based on the environment to which one belongs (Lucchetti et al., 2018). Thus, I compared the scores of each screening by dividing them into quartiles. I focused on three groups. First, students in the first quartile for the perceived mental health but in the fourth quartile for the actual results were labeled as the Problem x Unaware group. Second, students in the fourth quartile for the perceived mental health but in the fourth quartile for the actual results were the Problem x Aware group. Other students were categorized as NONE. Figure 15 shows the ratio. Problem x Unaware group ratio shows that the first overall usage rate was 40% (n = 10), second advanced was 48% (n = 12), and service registration was 12% (n = 3). Problem x Aware group ratio shows that the first overall was 57.7% (n = 41), second advanced was 36.4% (n = 26), and registration was 5.6% (n = 4). NONE ratio shows that the first overall was 63.6% (n = 35), second advanced was 36.4% (n = 20), and service registration was 0%. Second advanced usage rate was in the order of Problem x Unaware, Problem x Aware and NONE groups; service registration ratio was in the same order. When I set the first overall to 0, second advanced group to 1, and service registration to 2, it showed a statistically significant difference in ANOVA ($p < .5$). The results of post-hoc test showed there is a statistically significant difference between the Problem x Unaware and NONE groups ($p < .5$).

3.2 Sensitivity

3.2.1 Demographics Sensitivity

There are three demographics-related information: age, sex, and degree on the introduction page. The total showed that the mean was 2.17 (SD = 1.2). In the overall group, the mean was 2.24 (SD = 1.02), and in the advanced group, the mean was 2.1 (SD = 1.03). The mean for the service registration group was 1.85 (SD = 0.69). Although there was a little difference, there was no statistically significant difference. The total showed that the mean was 2.17 (SD = 1). This implies that when using mental health services, students have little repulsion towards entering age, sex, and degree.

3.2.2 Email Sensitivity

The total showed that the mean was 2.39 (SD = 2.97) for email sensitivity. The mean in the overall group was 2.19 (SD = 2.63), in the advanced group was 2.86 (SD = 3.49), and in the service registration was 1 (SD = 1.29). There were some differences in the results. However, they were not statistically significant.

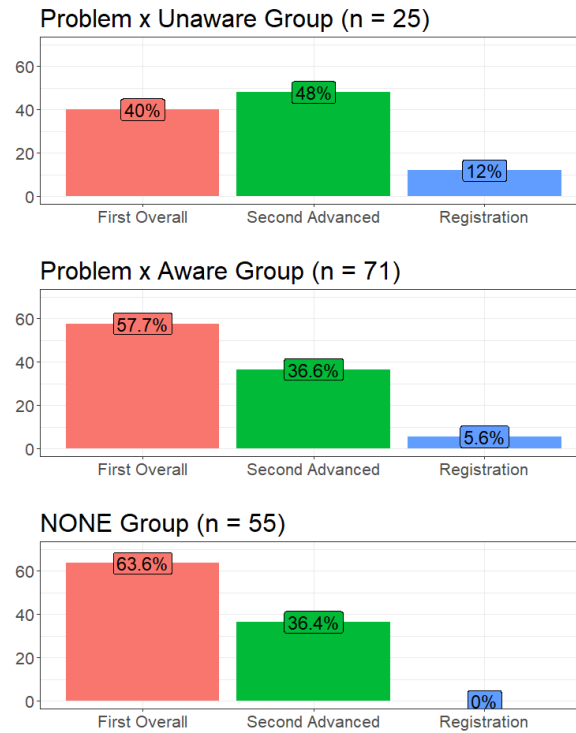


Figure 13. Compare perceived mental health with actual screening

3.2.3 Phone Sensitivity

The total showed that the mean was 3.88 (SD = 2.97) for phone sensitivity. The mean in the overall group was 3.88 (SD = 3.43), in the advanced group was 4.17 (SD = 3.62), and in the service registration group was 1 (SD = 1.29). There were some differences in the results, but these differences were not statistically significant.

3.2.4 Email and Phone Sensitivity Comparison

Email and phone sensitivity showed statistically significant differences ($p < .0005$) in the overall group and in the advanced group ($p < .05$). There was no difference in the service registration group.

3.3 Reasons for Quitting the First Overall Screening

I asked the participants who left after the first overall screening as to why they did not use the second advanced screening or service registration. The question was, “Reasons for not using the service

registration and second advanced screening.” There were four options for multiple choice questions: “I don’t have time,” “I got enough information,” “It was not helpful,” and “Feedback was disappointing.” Twenty-four participants answered the question. Of the total, 50% (n = 12) responded with “I got enough information,” 33% (n = 8) with “I don’t have time,” 12.5% (n = 3) with “It was not helpful,” and 4.2% (n = 1) with “Feedback was disappointing.” The reasons for finishing at first overall screening part indicated that 83% were not negative responses and 17% were negative.

4. Implications

Mental health problems within the campus continue to rise. The problems of accessibility and cost have been solved through on-campus healthcare centers. However, students still exhibit reluctance in using mental health services and lack awareness. This is because they do not recognize their mental health accurately and have a low MHL (Jorm, 2012) that prevents them from using mental health services. This study aimed at developing and applying a responsive online screening for improving students' MHL. Participants can check their overall mental health in the first step, and they then see the visualization of the results with brief comments. Additionally, other new second advanced screenings are recommended based on the results to learn more about their mental health or register with a healthcare center offline. It is accessible, and it offers the screening without requiring any personal information.

A total of 189 students took the screening. Among them, the data of 151 were analyzed. Participants who used the English version of the screening ($n = 27$) and failed to pass the validation question ($n = 11$) were excluded.

4.1 Feasibility in the Real World

I suggested a step proposing a second advanced screening and service registration after the first overall screening, which was used by 43% of the participants ($n = 65$). The fact that they followed the newly proposed service flow shows the service is worth the consideration. In other words, it can be implied that they were satisfied with the results shown through the text, visualizations, and the difference between the results shown and the mental health they perceived. Reasons for stopping the screening at the first overall step revealed that 83% of the participants did not have negative reasons, such as lack of time to conduct additional screenings and getting enough information, and 17% had negative reasons, such as disappointing feedback and not finding the screening helpful. The overall results indicate that responsive online screening is feasible in the real world.

4.2 Become Interested in Mental Health

There are three categories, Problem x Unaware, Problem x Aware and None group and the total number of people in each group is 25, 71 and 55. Problems x Unaware group ($n = 10$, 40%) was first overall, followed by second advanced ($n = 12$, 48%), and service registration groups ($n = 3$, 12%). The Problems

x Aware group (n = 41, 57.7%) was first overall, followed by second advanced (n = 26, 36.6%), and service registration (n = 4, 5.6%). The NONE group (n = 35, 63.6%) was first overall, followed by second advanced (n = 20, 48%), and service registration (0%). The usage ratio of the second advanced screening was in the order of problems x unaware, problems x aware, and none. The order of service registration rate was the same as the second advanced screening, which was also statistically significant. Thus, this indicates that the screening can encourage students' interest in mental health service. Participants with low MHL who thought they were mentally healthy but were not tended to use the screening and follow the flow more. The misperception decreases when a person who misperceives himself or herself is shown results that use actual verified measurement methods. For example, when a person who underestimated his or her weight is shown his or her BMI, he or she is less inclined to underestimate his or her weight.

The screening service checks overall mental health as a first step. As I mentioned, traditional online screening usually checks only one symptom, but it checks the overall status because many students shy away from mental health services due to lack of awareness (Oldham & Robinson, 2016). I assume that it is better to check the overall status for students with low mental health literacy. Additionally, results can be downloaded as image files. Subsequently, the service suggests second advanced screening and offline service registration. It also helps reduce stigma often experienced in mental health because the screening does not receive any information about privacy when using the service, such as phone number, student identification and even if they store images. When each step is completed, offline services are also linked so that students receive enough information about mental health just by using the service. In total, 40.3% of the participants followed the proposed service and the reason for finishing the first screening was not negative (83%). Furthermore, it has also increased interest in mental health by employing ideas based on similar concepts in other fields. Hence, this service is valuable because it creates a well-founded service by adopting similar ideas from other fields.

4.3 Limitations

This study had some limitations. First, the number of participants was small. It is because the screening invite was sent to students only via e-mail. There were no monetary rewards, such as gift vouchers. However, considering the situation, despite the small number, it was meaningful. Second, it had a high bounce rate (37.73%) on the introduction page. This could be because of the volume of text on this page. The text must be shortened, while still providing enough information about the service. Lastly, there was no qualitative study from the students' perspective. It would be better to evaluate this concept using qualitative methods. For instance, enquiring about how participants felt when they received results with

differences between the actual screening and perceived mental health score.

5. Future work

There are some further steps to be taken to improve the responsive screening even further. It would be beneficial to create a function that compares the previous and current scores. In this way, students can associate their past actions and realize what led to their mental issues. Second relates to not presenting the results in the screening order but presenting the differences first. Since there are six screenings, it takes a total of five steps to view the final result. Participants may turn the visualization over to the side and give up midway without viewing it all. It would be better to show more meaningful visualizations first. Although the results come from the text, it is expected to be more effective because it attracts attention if the visualizations are shown from the differences. Lastly, a report could be provided. For example, it could explain the side effects if the problems continue and provide examples of how to overcome the problems. Some students may not yet be able to use mental health services due to stigma. If a report is provided as an alternative, they may be more interested in mental health, and they will actively use mental health services.

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Appendix

Counselor's Feedback

First Feedback	Counselor A	<ol style="list-style-type: none"> 1. 설문 목적에 대한 설명이 먼저 들어 가는 게 좋을 것 같음. 2. 첫장에서 성별/소속/학위과정을 작성했는데 각 페이지 마지막에 또 나옴 의도가 있는지? 3. 3페이지부터 화면 레이아웃이 다름 (2페이지까지는 화면 창에서 가운데 나옴) 4. 3페이지에서 응답을 천천히 했더니 연결이 유실됨. 5. 검사 제목은 약어 외에 풀어서 설명해주지 않는지? 6. 본 대학에 실시할 경우 결과페이지 센터링크 사용에 대한 설명이 필요할듯함. 7. 타 대학에도 실시할 예정이라면 결과페이지에 센터 링크 있는 것은 어떻게 처리할지? -이건 쉽게 처리 가능함 8. 결과창에서 시각적으로는 차이가 느껴지나, 일반기준과 다르다는 것이 어떤 의미인지 알려줄 필요가 있을 것으로 보임.
	Counselor B	<ol style="list-style-type: none"> 1. 도입부 설명에서 진하기, 기울기, 밑줄 등 이용하여 주요 내용 강조 2. 결과 확인 그래프 '나의 점수' 를 한눈에 볼 수 있는 색으로 변경 및 한줄 이상의 간단한 결과해석 제시 3. 결과 확인 그래프에 대한 이해를 높이기 위해 한글제목 병기(예: API 결과 -> API(지연행동) 결과 4. 이미지 첨부를 통해 '헬스케어센터 상담 신청 바로가기' 강조
	Counselor C	<ol style="list-style-type: none"> 1. 도입부 내용 추가: 설문 후 자신의 결과를 알 수 있다는 내용이 없음. 학교 평균이나 전체 평균과 비교해서 볼 수 있다는 내용이 추가되었으면 좋겠음. 참여도나 만족도를 높일 수 있겠음. 2. 결과제시 방법: 우울이나 불안 점수는 합산 점수의 구간에 따라 해석내용이 달라질 수 있음. 해석 설명을 넣는 고려해볼 수 있겠음. 3. 오류 수정: 중간중간 오타나 띄어쓰기 수정 필요 4. 검사제목의 약어는 풀어서 설명하지 않는 것이 좋겠음. 완벽주의, 지연행동 등의 이름이 붙으면 답변에 영향을 줄 것 같다(지민샘 5번 의견에 대한 의견). -> 결과 페이지에 설명을 넣는 방식은 어떤지?

	Counselor D	<ol style="list-style-type: none"> 1. 이해를 돕기 위해 ‘지연행동->미루기 행동’ 으로 변경 가능한지? 2. 첫페이지에서 ‘추가적인 안내가 진행될 수 있습니다.’가 추가 설문을 의미하는 것이라면 설문이라고 명시해야할 듯. 3. 연락처 우선 순위 바꾸기: 연구담당자가 문의 전화 받는 게 나올 것 같아요. 4. 오타 확인 필요 5. 영문페이지로 전환 시 안내문이 한글로 제시됨 6. 각 설문페이지 상단에 총00 문항 적어주기 7. 결과 다운로드 시 ‘전체 다운로드’ 기능 필요(설문 별로 개별 다운로드 번거로움) 8. 실시하는 과정에서는 설문이름 약어 제공이 괜찮아보이나, 결과 제시할 때에는 설문 전체이름을 제시하는 것이 좋겠음. 9. 구간별 해석내용이 있는 경우 그래퍼 배경에 구간을 색으로 설정해두거나, 아래에 공통 범주에 대한 해석 내용 간략 제공하는 것이 좋겠음. 상대적인 결과만 알 수 있으므로 해석적 의미가 떨어져보임. 10. 센터링크 제공할 때, 설문관련 추가상담이 아닌 개인상담 목적임을 설명.
Second Feedback	Counselor A	<ul style="list-style-type: none"> · 오타확인 필요 - 동의1에서 개정정보처리 -> 개인정보처리 등 - ASRS 15. 사회적 상황에서 나 혼잣말을 너무 많이 한다고 느끼는 경우가 있습니까? · 나의 정신건강 파악하기 -> 나의 정신건강 알아보기/확인하기? · 수면위생 -> 수면 or 수면문제 · 각 설문의 기간 강조 -> 지난 한달 동안(밀줄) · 학위과정에서 기타 항목은 필요 없을까요? (입학을 앞두고 연구실 근무 중... 등) · 동의1에서 말하는 수집 목적과 항목, 처리에 대한 안내사항이 없습니다. · 동의2 ‘본 설문 외에 추가적인 설문 등을 안내하는 것에 동의하십니까?’ · 첫 페이지 ‘서비스를 받아볼 수도 있습니다.’ 뒤에 ‘아래 안내사항을 읽어보시고 순서에 따라 참여해주세요.’ 추가하기 · 안내에서 ‘결과 그래프를 확인 및 저장 가능합니다’ -> 설문 종료 후 내 결과를 확인하고 저장할 수 있습니다. · 슬라이더에서 0(아니다)~ 10(그렇다) : 방향성을 제시하면 도움이 되지 않을까요.

		<ul style="list-style-type: none"> · 슬라이더에서 기준점(가운데 평균점?)이 없다면 어쩔 수 없지만 중간지점 포인트가 있으면 도움이 될 것 같습니다?(표준시행을 고려하여). · 오전, 오후(AM, PM) 표시를 앞쪽으로 배치 · 유니스트 헬스케어센터에서 제공하는 완벽주의, 미루기 행동, 수면 위생, 우울, 불안에 대한 서비스를 이용해보시는 건 어떨까요?(특화된 치료 프로그램이 있다고 기대할 수 있음) -> 본 설문에서 측정한 완벽주의, 미루기 행동, 수면문제, 우울, 불안 등과 관련하여 고민이 있으시다면 헬스케어센터에서 상담 및 치료를 받을 수 있습니다. 아래 링크를 통해 서비스 이용 신청을 하거나 안내 리플릿을 다운 받으세요. · 결과 페이지에서, 실제점수-> ‘나의 점수’ 로 수정(내 점수가 맞다면) · 예상점수, 위험점수가 무엇인지 설명이 있으면 좋겠습니다. · ASHS(수면위생) 결과 그래프에서 ‘위험점수’ 그래프는 안뜸(실제 점수와 예상점수만 뜸) · ASHS(수면위생) : 수면위생이라는 말이 일반적으로는 낯설게 느껴질 수 있음. 수면 문제 혹은 다른 관련된 일반적인 단어로 대체하기. · 상담신청바로가기 -> ‘서비스 신청 바로가기’로 수정 · 홍보리플릿 최신 버전아님: 최신 파일 첨부 · 헬스케어센터 홍보 리플릿 다운받기 -> ‘헬스케어센터 서비스안내 리플릿 보기’ 로 수정 · ASRS(성인 주의력 결핍v 결과 -> ASRS(성인 ADHD 증상 자기보고 질문지) 결과 · 성인 ADHD, 완벽주의, 미루기 행동, 수면 위생, 우울, 불안 점수가 예측하신 점수 보다 안 좋게 나왔습니다.: 무슨 뜻인지 모르겠어요. -> 설문 결과 총 6개 영역 중 성인 ADHD 증상, 완벽주의, 우울, 불안 영역에서 ~~하게 나왔습니다.(예상점수 뜻을 풀어서 설명하기). · 완벽주의, 미루기 행동, 수면 문제, 우울, 불안 점수가 위험 점수보다 높게 측정되어 일상생활에서 불편함이 발생할 수 있습니다. or 관심이 필요한 상태입니다. 전문가와 상의해보시기를 권합니다.
Counselor B		<p>전체적으로 너무 좋은 것 같아요!! 조금 수정 의견을 보태자면...</p> <p>1. 크롬에서 더 잘 보이는 것 같아요. 익스플로러에서는 막대 모양이 좀 망가집니다(검정 막대가 부각됨). 최적화 안내가 있으면</p>

	<p>좋을듯합니다.</p> <p>2. 검사 결과 제공시...00 점수가 예측하신 점수보다 안 좋게 나왔습니다 -> ‘00점수가 위험점수보다는 낮지만 예측하신 점수보다 높게 왔습니다.’ 로 수정</p> <p>3. 센터 홍보 리플릿 최종본으로 업로드 부탁드립니다(영문은 확인안해봤어요...)</p> <p>4. 첫 페이지에서 슬라이드 바 색깔이 검정색이라서 어두움. 밝은 색으로 변경.</p>
Counselor B	<p>1. 일단 설명에 점수가 예측보다 안 좋게 나왔다는 표현이 좀 애매한거 같아요~! 다른 표현으로 바뀌면 좋겠어요.</p> <p>2. 제가 그냥 아침에 한줄로 다 똑같은 답변을 선택해 봤거든요? 그래도 페이지가 넘어가더라구요! 실제로 한줄로 다 똑같은 답변만 나오는 학생도 있겠지만 가능하면 경고창 같은게 하나 뜨면 어떨까요? 제대로 했냐 이런걸로? 단, 뭐 답안을 바꾸지 않아도 페이지는 넘어가지만 그냥 알림 차원으로? 이걸 그냥 추가의견이라 별로 중요한 게 아니니 무시하셔도 됩니다!</p>
Counselor D	<p>1. 위험점수보다 높다는 말의 의미에 대해서 간략한 설명이 있다면 서비스 연계가 더 잘 될 것 같습니다.</p>