Address Youth Mental Health Issue During COVID-19 Pandemic through Web System

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Abstract: Since the outbreak of COVID-19, scientists around the world have worked to address the problems it poses. Researchers predict that the negative effects of COVID-19 will persist and are not limited to pathological problems, but rather to psychological aspects. While there are many scales and various web-based psychological systems developed to measure people's mental health, research on mental health assessment systems in the context of the COVID-19 pandemic is relatively rare, especially systems that include recommendations for analysing the results of the assessment. The system was developed and validated in two phases. The empirical phase provides a comparative analysis of the results of the youth group before and after using the system. The results suggest that the system can make quick and effective decisions to help address youth mental health issues during the COVID-19 pandemic.

1. Introduction

According to World Health Organization (WHO) declared COVID-19 a pandemic [1]. COVID-19 is one of the most challenging infectious diseases that has generated the most global attention in recent years. The outbreak of the new coronavirus has not only affected the global economy, but has also put people under enormous stress. The stress caused by this epidemic has been affecting everyone. The rapid increase in confirmed cases and deaths has caused psychological problems such as stress, anxiety and depression in the general population [2].

The rapid global spread of COVID-19 has led to strict measures by the relevant governments to curb its spread, such as strict quarantines and the closure of most gathering places, significantly altering people's lives and putting their mental health and psychosocial functioning at risk[3].

In such a social situation, universities around the world have had to adapt their campus activities in response, transitioning various courses and programmes from a face-to-face delivery model to an online delivery model[4]. This has thus created new challenges for participants, such as the development of different learning methods and more autonomous management of learning paths. All these factors will reduce the stability of the psychological state of young people[5]. And the

changing epidemiological situation and the diversity of the youth population both make the test uncertain.

In response to this uncertainty, which is difficult to estimate and measure, the World Wide Web offers a new tool for survey researchers to collect data. The first widely used web-based psychological tool was "Amazon Mechanical Turk" [6]. This is where Internet market researchers can recruit subjects to participate in an online study. MTurk is used mainly by researchers from the USA. It turns out that the MTurk sample does not exactly match the characteristics of the US population. For example, the MTurk population is mostly white and female, and they are more educated and younger compared to the US population as a whole. However, the quality of the data obtained is still good enough [7]. MTurk has been successfully used to study attention [8], creativity and dishonest behaviour [9] or sexual attitudes [10]. It has been shown that MTurk can even be a valuable tool for working with clinical populations. In addition to this, there is the COVID-19 Phobia Scale (C19P-S) developed by the Ibrahim Arpaci,, Kasım Karataş , Mustafa Baloğlu study, where researchers predict that the negative effects of the novel coronavirus (COVID-19) pandemic will continue in 2019, and that these negative effects are not just confined to psychopathological issues.

Following the success of MTurk, new technologies began to emerge and more and more systems on psychometric assessment services proliferated. Recent studies investigating the psychological impact of the current pandemic have considered aspects of mental illness such as common mental health disorders ranging from anxiety, depression, sleep disorders and other symptoms [4, 5]. To the best of this study's knowledge, there are no studies that have used positive predictions to assess the psychological state of youth in such international emergencies and interfere with this impact by using a psychometric health system. Therefore, the presentation of youth mental health status through web technology in the context of the COVID-19 pandemic is an issue that needs to be addressed urgently.

2. Review and Methodology

In terms of how to conduct this study of impact interference, which was done in the system development phase of this study, MTurk has been successfully used to study attention [8], creativity and dishonest behaviour [9] or sexual attitudes [10]. It has been shown that MTurk can even be a valuable tool for working with clinical populations. In addition to this, there is the COVID-19 Phobia Scale (C19P-S) developed by Ibrahim Arpaci,, Kasım Karataş , Mustafa Baloğlu research.

After this study a self-report instrument was developed with items addressing specific phobia diagnostic criteria of the DSM-V and its initial psychometric properties were tested. The results indicated that the scale had initial construct, convergent, discriminant and internal consistency reliability. The scale should be further tested; however, the COVID-19 Phobia Scale (C1gP-S) items provide support for assessing levels of phobic response in various age groups. As with the CAS, there was no suggestion of a corresponding analysis of the score bands after people had measured them.

Ultimately, the official Health Sichuan published rapid assessment tool on mental health needs in response to the new coronary pneumonia outbreak was chosen for this study. This scale is a tool for professionals to assess the mental health of individuals, or individuals themselves, for anxiety, depression and sleep problems, and is suitable for adults and adolescents who can understand the questions. The main method is to choose from a selection of answers based on the individual's situation from 2 or 3 weeks ago to the present, and to score them according to the scoring method, and to assess the mental health status and give recommendations according to the score. The reliability of the self-assessment questionnaire will be determined by the individual's ability to

report their psychological state. In this study, the questionnaire was chosen to be scored on a 4-point scale, with positive scores ranging from 0 for "not at all" to 3 for "much more than usual", of which 6 items were negative; and negative scores ranging from 3 for "not at all" to 3 for "much more than usual". The reverse scoring was from "not at all" with 3 points to "much more than usual" with 0 points, and these 6 items were positive items. A total score of 0-36 was used, with higher scores indicating higher levels of psychological problems. 11 was used as the cut-off score for possible psychological problems. Among the score ranges, the study also has corresponding assessment recommendations.

Score of 0: Suggests that the individual is currently in a good psychological condition, does not have psycho-emotional problems and does not require psychological services for the time being.

Score of 1-8: Suggests that the individual is currently experiencing minor psychological and emotional problems, which require attention, self-regulation, mental health education or general supportive interventions.

Score of 9-11: Indicates that the individual is currently in a poor psycho-emotional state, at a critical state, and requires active attention. An interview with a professional with a background in psychological services is recommended to further understand the state of mental health and to decide on a further treatment plan based on the results.

Score of 12 and above: Usually indicates that the individual is in a significantly poor mental health state and may be at risk of mental illness, requiring an interview with a psychiatrist to determine whether the individual needs psychotherapy, medication and admission to hospital.

This study proposes that as a psychological assessment system and a psychological assessment data management system, there is also a need to take full account of the following needs: web-based technologies in psychology are important because they are not only relevant to the scientific community but must also provide participants with programmes appropriate to their psychophysiological development and health status, and without any ongoing psychological assessment, it is impossible to meet the requirements of universities. This is why this study also includes assessment and recommendations in the functional design of the system in order to better improve youth mental health issues.

Sample: The participants were 30 young people randomly recruited from China. The ages were clustered between 15-35 years old and the only requirement for participation in the study was that all of them had access to the internet at home in order to informally control for the participants' familiarity with the required technology. Although not all 30 participants were equally familiar with the Internet, this work was integrated into a project whose ultimate aim was to develop a Web technology-based website for the psychometric assessment of youth in the COVID-19 pandemic, so that the sample was similar to the target population (youth) in terms of Internet familiarity.

Instrument: An assessment single scale, which was tested individually before all 30 participants had used the psychometric assessment, which was the first test result; then a full psychometric system, which was tested again using the same assessment scale after the 30 computer science and technology participants had used the assessment system, and finally the test results.

Process: A typical test-retest design was conducted for this study. A single scale questionnaire was used for testing and a questionnaire from the web-based psychometric system was used for retesting. After 30 participants verbally agreed to participate in the study, they were briefed on the detailed assessment process and later completed the questionnaire. Identification of participants to the online questionnaire was achieved through a nickname written by each participant. To ensure that participants completed the online task, the study requested a telephone number for reminder information and follow-up instructions. At the end of the single scale test, participants will be given access to a web-based version of the psychometric system where most of the features will be used, such as: music playback, relevant psychological trivia, psychological counselling, etc. A second

psychometric test will then be administered 14 days after using the psychometric system, using the assessment scales on the system.
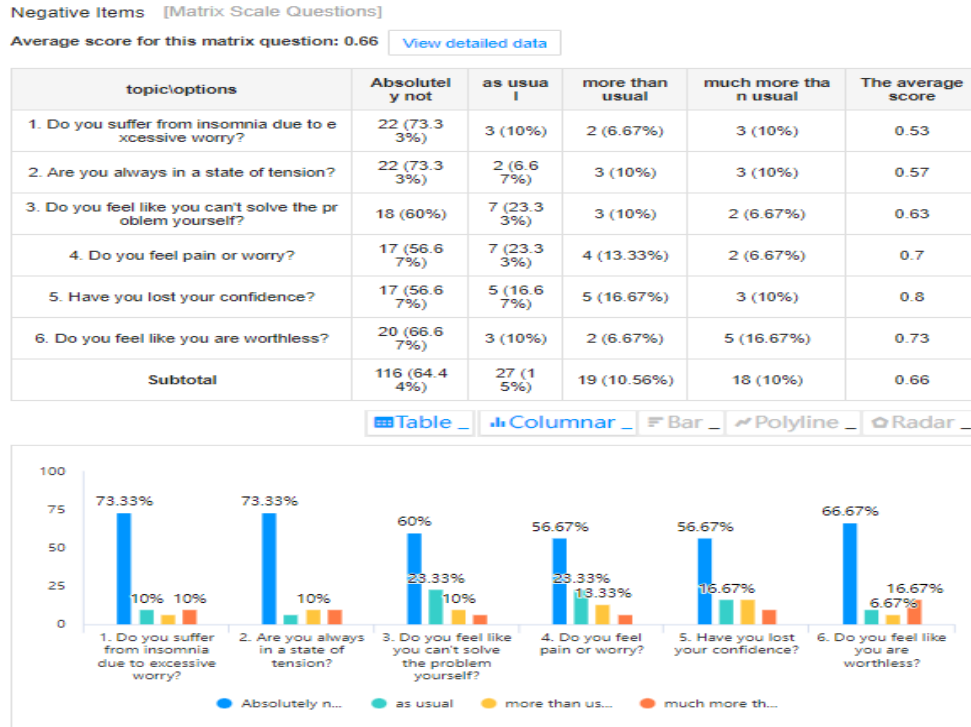
3. Result and Analysis

Negative Items   [Matrix Scale Questions]

Average score for this matrix question: 0.66   View detailed data

topic\options	Absolutely not	as usual	more than usual	much more than usual	The average score
1. Do you suffer from insomnia due to excessive worry?	22 (73.33%)	3 (10%)	2 (6.67%)	3 (10%)	0.53
2. Are you always in a state of tension?	22 (73.33%)	2 (6.67%)	3 (10%)	3 (10%)	0.57
3. Do you feel like you can't solve the problem yourself?	18 (60%)	7 (23.33%)	3 (10%)	2 (6.67%)	0.63
4. Do you feel pain or worry?	17 (56.67%)	7 (23.33%)	4 (13.33%)	2 (6.67%)	0.7
5. Have you lost your confidence?	17 (56.67%)	5 (16.67%)	5 (16.67%)	3 (10%)	0.8
6. Do you feel like you are worthless?	20 (66.67%)	3 (10%)	2 (6.67%)	5 (16.67%)	0.73
Subtotal	116 (64.44%)	27 (15%)	19 (10.56%)	18 (10%)	0.66

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Figure 1: Single scale negative item measurement data (1)

Positive Items   [Matrix Scale Questions]

Average score for this matrix question: 0.54   View detailed data

topic\options	much more than usual	more than usual	as usual	Absolutely not	The average score
1. Can you concentrate when doing something?	23 (76.67%)	4 (13.33%)	1 (3.33%)	2 (6.67%)	0.4
2. Do you think you are a useful person?	22 (73.33%)	6 (20%)	1 (3.33%)	1 (3.33%)	0.37
3. Do you feel decisive?	20 (66.67%)	7 (23.33%)	2 (6.67%)	1 (3.33%)	0.47
4. Can you enjoy daily activities?	21 (70%)	5 (16.67%)	2 (6.67%)	2 (6.67%)	0.5
5. Can you face the problems you face?	18 (60%)	4 (13.33%)	7 (23.33%)	1 (3.33%)	0.7
6. Do you think everything is going well?	16 (53.33%)	8 (26.67%)	1 (3.33%)	5 (16.67%)	0.83
Subtotal	120 (66.67%)	34 (18.89%)	14 (7.78%)	12 (6.67%)	0.54

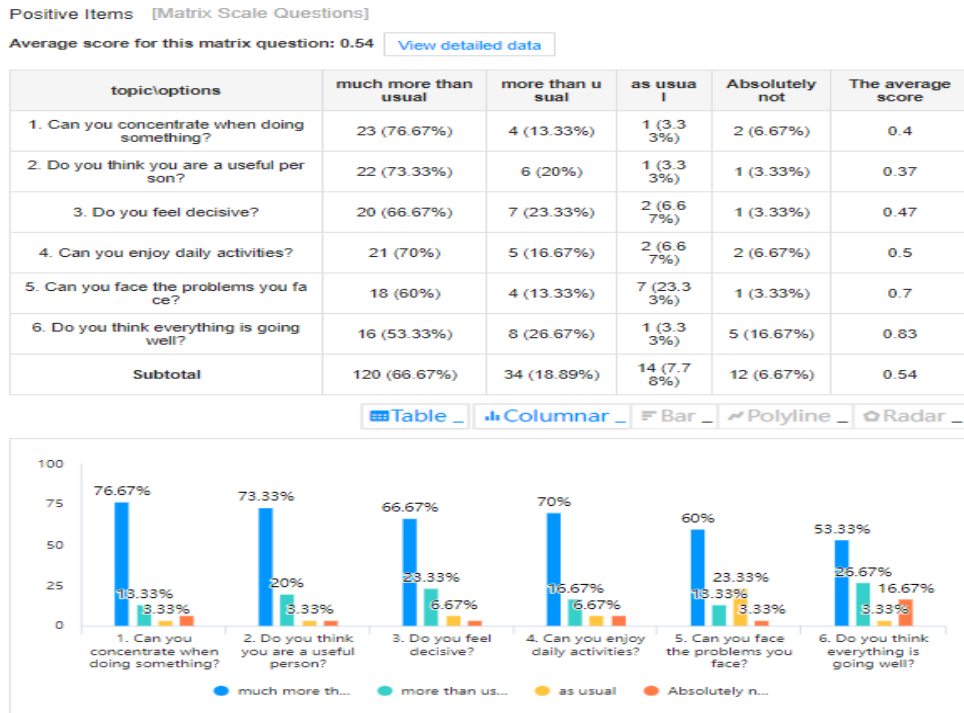⊞Table _ ıl Columnar _ ⹀Bar _ ⟋Polyline _ ✿Radar _

Figure 2: Single scale positive item measurement data (2)

At the initial stage of system completion, this study began with a psychological test for 30 participants using the Rapid Assessment of Mental Health Needs Scale for Coping with the New Coronary Pneumonia Epidemic published by Sichuan Official Emblem. The results of this study through the assessment are shown in the figure 1 and 2.

The average score of the 30 participants who took the test was 10.47. The scale was based on the degree of choice of items, which were divided into two categories: negative items and positive items. There were six multiple-choice questions for each of the two items, with zero points for "not at all" in the negative item, and one point for "not at all" to "much more than usual" in ascending order to 3 points. For positive items, a score of 3 is given for "not at all" and a score of 1 to 0 is given for "not at all" and "much more than usual" in descending order. In the entire multiple-choice scale, a score of 11 is used as the cut-off score for possible psychological problems, and the initial score of 10.47 falls within the 9-11 range. However, the recommendation of this study is to suggest that the individual's current psychological and emotional state is not good and is in a critical state and requires active attention. An interview with a professional with a background in psychological services is recommended to gain further insight into the mental health status and to decide on a further management plan based on the results.

The study then reassessed all 30 participants fourteen days later using the entire psychometric system, using the same scales as before, for the retest experiment. The results of the measurement are shown in Figure 3 and Figure 4.

Negative Items [Matrix Scale Questions]

Average score for this matrix question: 0.29   View detailed data

topic\options	Absolutely not	as usual	more than usual	much more than usual	The average score
1. Do you suffer from insomnia due to excessive worry?	25 (83.33%)	2 (6.67%)	2 (6.67%)	1 (3.33%)	0.3
2. Are you always in a state of tension?	17 (56.67%)	5 (16.67%)	7 (23.33%)	1 (3.33%)	0.73
3. Do you feel like you can't solve the problem yourself?	28 (93.33%)	2 (6.67%)	0 (0%)	0 (0%)	0.07
4. Do you feel pain or worry?	25 (83.33%)	3 (10%)	2 (6.67%)	0 (0%)	0.23
5. Have you lost your confidence?	26 (86.67%)	1 (3.33%)	2 (6.67%)	1 (3.33%)	0.27
6. Do you feel like you are worthless?	27 (90%)	2 (6.67%)	0 (0%)	1 (3.33%)	0.17
Subtotal	148 (82.22%)	15 (8.33%)	13 (7.22%)	4 (2.22%)	0.29

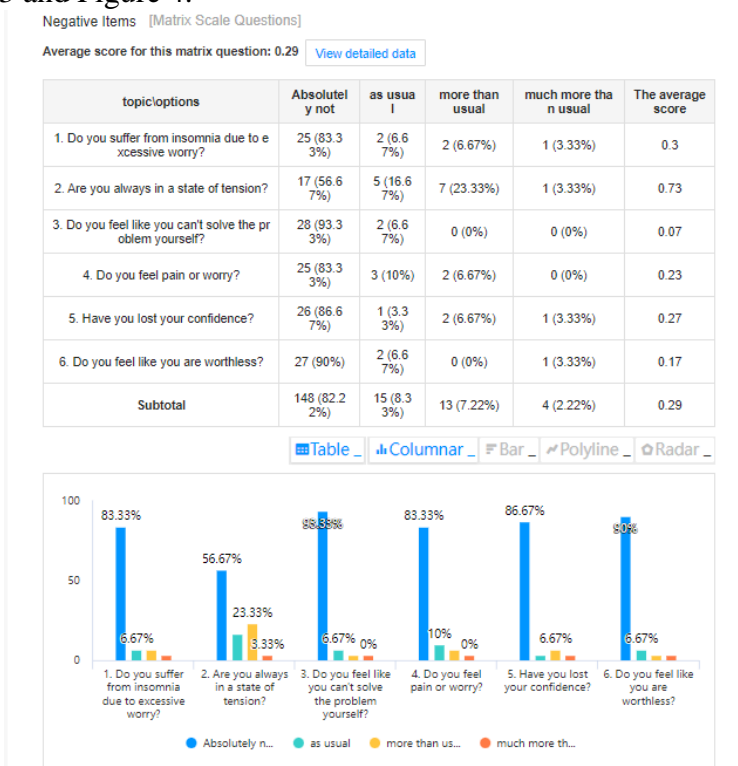Table _ | Columnar _ | Bar _ | Polyline _ | Radar _

Figure 3: Negative item measurement data after the second test (1)

As a result of this test, the final overall mean score was 3.4. This score is in the range of 1-8, suggesting that the individual is currently experiencing minor psycho-emotional problems that require attention and can be self-regulated, with mental health education or general supportive interventions being the main focus. Given that a score of 11 is used as a delineation judgment score for possible mental health problems, there is no doubt that after 14 days, the results of the re-assessment of the sample participants were satisfactory, and the change from a score of 10.47 to 3.4 clearly shows that the mental health status of the thirty sample participants improved a lot, even

if they did not reach a full score of 0. However, this situation can be fully self-regulated through subsequent self-regulation to reach a healthy The above is an overall state.

While the above is an overall picture, a breakdown of the sub-topics for each item also shows the differences in the retesting experiment, starting with the results of the single scale assessment.
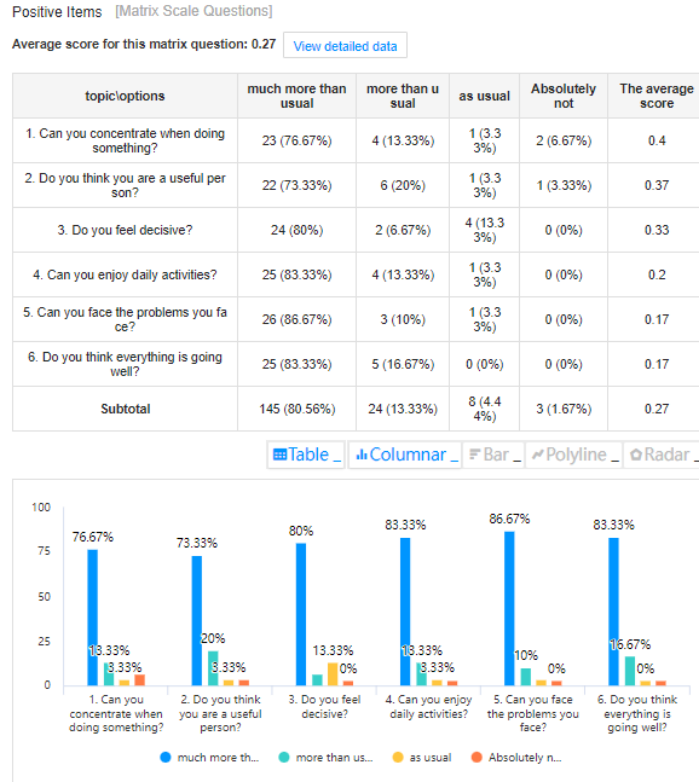
Positive Items [Matrix Scale Questions]

Average score for this matrix question: 0.27 | View detailed data

topic\options	much more than usual	more than usual	as usual	Absolutely not	The average score
1. Can you concentrate when doing something?	23 (76.67%)	4 (13.33%)	1 (3.33%)	2 (6.67%)	0.4
2. Do you think you are a useful person?	22 (73.33%)	6 (20%)	1 (3.33%)	1 (3.33%)	0.37
3. Do you feel decisive?	24 (80%)	2 (6.67%)	4 (13.33%)	0 (0%)	0.33
4. Can you enjoy daily activities?	25 (83.33%)	4 (13.33%)	1 (3.33%)	0 (0%)	0.2
5. Can you face the problems you face?	26 (86.67%)	3 (10%)	1 (3.33%)	0 (0%)	0.17
6. Do you think everything is going well?	25 (83.33%)	5 (16.67%)	0 (0%)	0 (0%)	0.17
Subtotal	145 (80.56%)	24 (13.33%)	8 (4.44%)	3 (1.67%)	0.27

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Figure 4: Negative item measurement data after the second test (2)

Negative Items [Matrix Scale Questions]

Average score for this matrix question: 0.66 | View overall data

(1) 1. Do you suffer from insomnia due to excessive worry?

Average score for this question: 0.53

options ⇕	Subtotal ⇕	Proportion	
Absolutely not	twenty two		73.33%
as usual	3		10%
more than usual	2		6.67%
much more than usual	3		10%
Number of valid fills in this question	**30**		

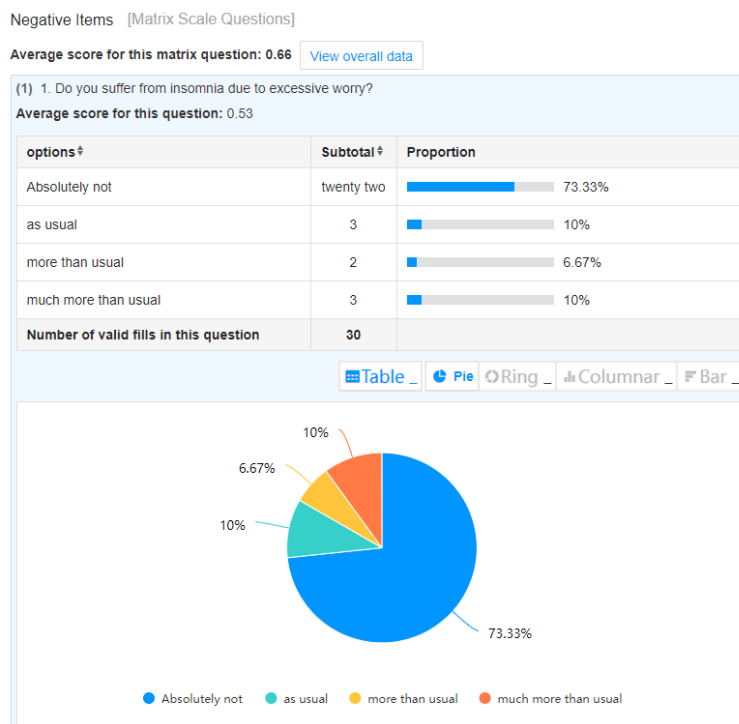⊞Table _ | ⬤ Pie | ⊙Ring _ | ⊪Columnar _ | ☰Bar _

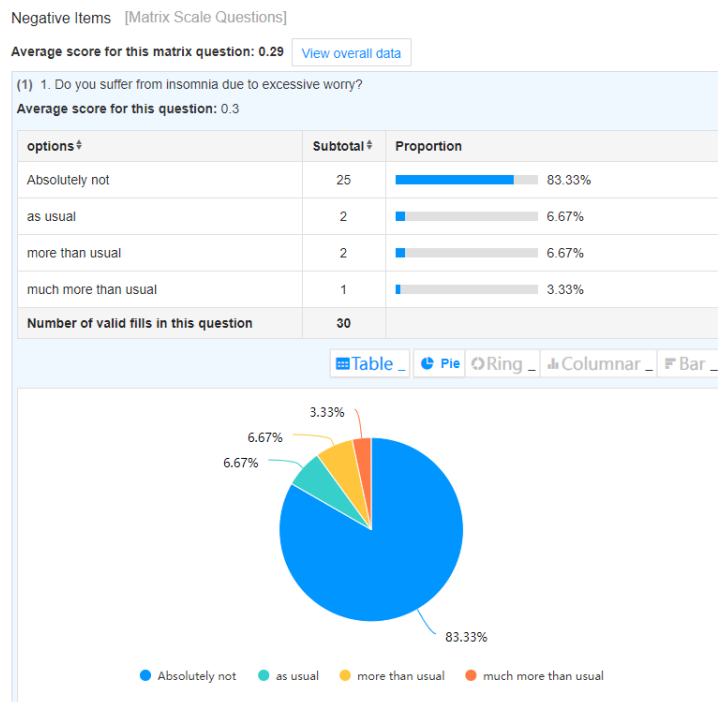Figure 5: Negative item (1) data of single scale

Figure 6: Data of negative item (1) in the retest

The question was "Do you have insomnia because you worry too much?" The answer to this question was 86.67% of the responses on a 4-point scale chose the "same as usual" option, with 6.67% choosing "not at all" and "more than usual". However, no one chose "a lot more than usual". This shows that the majority of the 30 participants (86.67%) were in a normal state at the time of the initial assessment, with only a small number (6.67%) having more insomnia than usual. The mean score for this question was 1, are shown in Figure 5 and Figure 6.

Through the retesting experiment, it is clear from the graph that the score for the same question dropped significantly by 0.7 points to 0.3 points on the second test (the lower the score on the negative item, the better the participant's mental state). The 6.67% who chose "not at all" increased to 83.33%. This again demonstrates the validity of the study's system, which not only measures the participants' mental health but also provides suggestions for assessing different situations and improving the mental health of young people.

4. Future and Limitations

In this study, youth who completed the assessment after using the system had higher levels of self-focus and improved mental health problems than participants who completed the assessment on the same psychometric questionnaire as the single scale. The internal consistency of the system version was similar to that of the single scale, and although the 30 young people in the sample participated in the study in different locations, this difference did not affect their responses in any systematic way. They chose to use the psychometric system at home, in a public computing venue or on another computer on campus, and although allowing access from multiple locations reduced experimental control, it did not appear to adversely affect the results More recently, this study drew its sample from youth affected by the COVID-19 pandemic, so it was more appropriate for the measurement process for this research study.

This study has limitations in terms of scope in terms of obtaining data and is more inclined to support the use of web-based questionnaires for questionnaire-based studies. However, more

validation of web-based studies is needed. The results of this study enhance the interest of youth in using psychometric systems that include tests and assessment recommendations, which in turn allow more participants to readily measure their psychological state and heal themselves while protecting their privacy. However, the system studied in this study was only local in nature, with participants drawn from university campuses and limited in age range, and in future research it would be desirable to have more data, use multiple measures and a wider sample to design a psychological self-assessment system that can be applied to any age group. Web-based technologies may play a key role in addressing these mental health issues. Given the rapid development of new methods, a web-based diagnostic tool for psychological and cognitive assessment and advice will be developed in the future and will include a wide range of recognised psychological methods.

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