

The Development of CounselCare: Student Mental Health Assessment for SM Stella Maris using Laravel Framework

Nurin Batrisyia Emira Mohd Nadzree¹, Nur Ariffin Mohd Zin^{1*}

¹ *Fakulti Sains Komputer dan Teknologi Maklumat,
Universiti Tun Hussein Onn Malaysia, Parit Raja, Batu Pahat, 86400, MALAYSIA*

²

*Corresponding Author: ariffin@uthm.edu.my

DOI: <https://doi.org/10.30880/aitcs.2024.05.02.053>

Article Info

Received: 25 July 2024

Accepted: 21 Oct 2024

Available online: 15 Dec 2024

Keywords

Mental Health, High School Students,
CounselCare, Web-Based System,
DASS, Student Well-being

Abstract

CounselCare is a web-based mental health assessment system for SM Stella Maris students, addressing rising mental health issues. Utilizing the Depression Anxiety Stress Scales (DASS), it enables regular assessments, timely interventions, and support. Key features include secure login, immediate assessments, results display for Depression, Anxiety, and Stress levels, and psychologist referrals. Modules include login, assessing mental health, managing assessment questions, managing cases, managing psychologists, and managing student and counsellor accounts. Counsellors can schedule intervention appointments, allow second assessments post-intervention, and generate referral letters for persistent high levels. Developed with HTML, CSS, JavaScript, PHP, and Laravel, CounselCare ensures user-friendliness and efficiency. The system follows an incremental prototyping model, allowing iterative testing and refinement based on user feedback. User acceptance testing indicated high satisfaction with its usability, functionality, design, reliability, and mental health insights. CounselCare significantly enhances mental health support at SM Stella Maris, promoting proactive interventions and environmental sustainability.

1. Introduction

Mental health encompasses emotional, psychological, and social well-being, influencing cognition, perception, and behavior [1]. Mental health awareness and support are pivotal in educational institutions today. The Depression Anxiety Stress Scale, or DASS, is a written screening test designed to identify an individual's level of depression, anxiety, and stress [2]. Through this screening test, you can determine your mental health status, whether you are experiencing stress, anxiety, or depression [3]. The DASS encompasses a set of three self-assessment scales strategically designed to gauge the presence of negative emotional conditions, specifically focusing on depression, anxiety, and stress. It is important to note that the DASS is not a diagnostic tool, but rather a resource that can be used to refer individuals facing challenges to a health clinic or specialist [2].

This assessment is usually done manually using paper-based evaluation forms, which can lead to human mistakes, paper waste, time delays, and counsellor bias. Manual scoring and data input problems including response miscalculation, and data entry errors can greatly affect assessment results. Such inaccuracies can damage assessment trust, reduce resource allocation, and increase counsellor workloads as they examine and fix errors. Paper-based evaluations can harm the environment. This procedure's errors lower accuracy and increase paper waste, worsening environmental issues. Manual evaluations take time since they need paper forms,

manual scoring, data entry, and analysis. Students with mental health concerns may wait longer for the following stage due to the manual method. Manual evaluations may be affected by counsellors' biases and judgement when counsellors' opinions or relationships with students influence assessment findings.

The project seeks to accomplish the following objectives: firstly, to create an assessment of mental health for high school students using an object-oriented approach; secondly, to build a web-based technology platform for a user-friendly and efficient mental health assessment procedure incorporating case management to customize interventions based on each student's evaluation results; and finally, to test the proposed design through alpha and beta testing. CounselCare was created specifically for SM Stella Maris in Sabah, with the goal of providing a thorough and gratifying experience for its target users—secondary school students. CounselCare's user base is divided into three categories: students, counsellors, and administrator. CounselCare features login, assess mental health, manage assessment questions, manage cases, manage psychologists, and manage student and counsellor accounts.

2. Literature Review

2.1 Depression Anxiety Stress Scale (DASS 21)

In recent years, the use of mental health assessments, notably the Depression Anxiety Stress Scale (DASS-21), has grown in popularity in addressing the psychological well-being of Malaysian secondary school students. It has been shown to be helpful in evaluating negative psychological consequences, with a stable component structure and solid psychometric features. The DASS-21 comprises of three measures that have been widely effective in both research and therapeutic applications among adults and are adaptable across languages. The Depression Scale assesses dysphoric mood states such as self-criticism, loss of interest or participation, and despair. Simultaneously, the Anxiety Scale assesses arousal states such as autonomic arousal, muscular tension, and anxiety sensation. Finally, the Stress Scale reliably identifies stressors and overall tension [2]. In accordance with Parkitny and McAuley's cautionary note, DASS scores should not be employed in isolation for diagnosing specific mood disorders like depression, as the instrument is not designed to substitute a comprehensive psychological evaluation [4]. The National Health and Morbidity Survey 2017 (NHMS 2017) [5] in Malaysia gathered data from over 30,000 secondary school teenagers aged 13 to 17, representing the Malay, Chinese, and Indian ethnic groups. The survey revealed that the rates of depression, anxiety, and stress were 18.3%, 39.7%, and 9.6% respectively.

For each item, a score ranging from 0 indicating the item did not apply to me at all to 3 indicating the item applied to me very much or most of the time. The items are categorized with the letters D for Depression, A for Anxiety, and S for Stress to signify their respective scales. The total scores for the specified elements within each scale D, A, and S is then calculated and the obtained scores are transferred to the DASS profile sheet, facilitating a comparative analysis of the three scales, and offering percentile rankings along with severity designations [6].

2.2 A study on similar application

To enhance the capabilities of the CounselCare system proposed, an exhaustive analysis of three existing systems: naluri [7], healthfocus [8], and iCliniq+ [9], has been undertaken. The comparative findings, showcasing the similarities, differences, and unique attributes of each existing system in relation to the proposed application, are detailed in Table 1.

Table 1 Comparison between Existing Application and Proposed System

Features/System	Naluri	Healthfocus	iCliniq+	CounselCare
Login	Yes	No	No	Yes
Homepage	Yes	No. Immediate assessment	No. Immediate assessment	Yes
Appointment Booking	Yes. One-on-One Therapy with a Mental Health Professional	Yes. Offers clinical psychology counselling with a clinical psychologist.	Yes. Offers paid video consultation with a doctor.	Yes. Counsellors schedule appointment with students who obtained high levels on the first assessment.

Table 1: (cont)

Scoring guide	No	Yes	Yes	Yes. Display
---------------	----	-----	-----	--------------

Result	Yes. Display only	score	Yes. Display result and score	obtained result and score	Yes
Generate PDF letter assigning a psychologist	No	No	No	No	Yes. Counselors can recommend a psychologist to parents in a PDF letter for students who obtained high levels on the second assessment.

3. Methodology

3.1 Prototyping Model

This study uses the incremental prototype methodology to guarantee that the product and its features are aligned with client expectations and needs before moving on to the coding phase. Stokes Jones defines the prototyping model as the iterative building, testing, and modification of a prototype until a sufficient output is reached, establishing the basis for the complete application [10]. Continuous delivery improves project performance by allowing for early evaluations and continuous improvements in each incremental phase, reducing the complexity of possible difficulties. The methodology provides strong project management by utilizing discrete stages throughout the project life cycle. The iterative process includes steps such as requirement analysis, design, implementation, and testing, with repeated iterations conducted until the result is acceptable by the customer. The Prototyping Software Development Model is depicted graphically in Fig. 1.

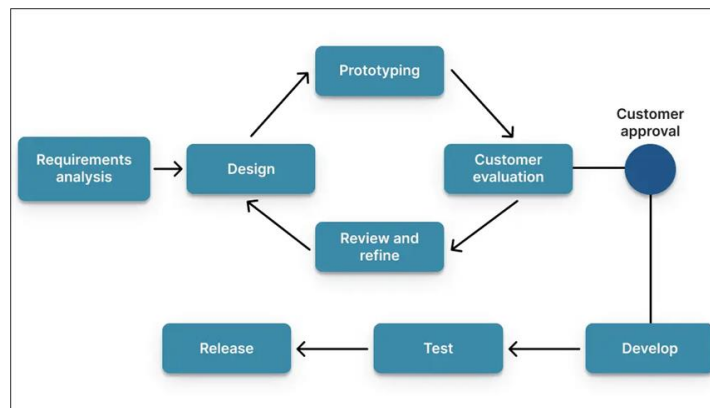


Fig. 1 Prototyping Software Development Model

Requirement analysis for CounselCare involves gathering and defining development needs through interviews and data analysis. The design phase creates preliminary system designs, including prototypes and wireframes for layout and user experience, focusing on accessibility and responsiveness. CounselCare's database is structured using a class diagram and object-oriented design.

An initial prototype, based on counsellors' needs, is reviewed by administrators, counsellors, and students for feedback. User evaluations refine the prototype, addressing strengths and weaknesses. Once approved, the system is developed, with coding aligned to the prototype using various development tools.

Post-development, rigorous testing ensures the system meets user requirements, continuing until quality standards are achieved. Upon completion, CounselCare is released, with final documentation and user guides. The prototype model workflow outlines each development step, emphasizing sequential stages and deliverables as shown in Table 2.

Table 2 Software Development Activities and their Task

Phase	Task	Output
Requirement Analysis	<ul style="list-style-type: none"> Propose Title 	<ul style="list-style-type: none"> Proposal

	<ul style="list-style-type: none"> • Consultation with Stakeholders • Gather User Requirements • Define Scope • Determine Features 	<ul style="list-style-type: none"> • Gantt chart • User, functional & non-functional requirement
Design	<p style="text-align: center;">First Iteration</p> <ul style="list-style-type: none"> • Develop a preliminary design for the CounselCare system 	<ul style="list-style-type: none"> • Flowchart • Use case diagram • UML class diagram
Prototyping	<ul style="list-style-type: none"> • Develop a Prototype • Implement Prototypes • Embed Safety Features 	<ul style="list-style-type: none"> • Prototype design for CounselCare
Customer Evaluation	<ul style="list-style-type: none"> • Gather feedback from users on the prototype 	<ul style="list-style-type: none"> • Report of user evaluation
Review and Refine	<ul style="list-style-type: none"> • Analyze User Feedback • Improve the Design <p style="text-align: center;">Second Iteration</p>	<ul style="list-style-type: none"> • Updated prototype
Design	<ul style="list-style-type: none"> • Refine and Improving Design • Create High-Fidelity Prototypes 	<ul style="list-style-type: none"> • Enhanced design with improvements • High-fidelity prototypes
Prototyping	<ul style="list-style-type: none"> • Develop an Advanced Prototype • Implement Prototypes • Enhance Database 	<ul style="list-style-type: none"> • Advanced version of the prototype • Improved and enhanced database
Customer Evaluation	<ul style="list-style-type: none"> • Gather feedback on the advanced prototype 	<ul style="list-style-type: none"> • Feedback gathered
Review and Refine	<ul style="list-style-type: none"> • Analyze User Feedback • Update the Design 	<ul style="list-style-type: none"> • Analysis of user feedback • Design updated based on feedback
Development	<ul style="list-style-type: none"> • Develop the Core Functionality • Implement Necessary Features • Integrate Databases 	<ul style="list-style-type: none"> • Program code incorporating expected features • A fully developed system database and interface.
Testing	<ul style="list-style-type: none"> • Perform Unit Testing • Conduct System Testing • Identify Areas of Improvement and Fix Issues 	<ul style="list-style-type: none"> • Test report
Release	<ul style="list-style-type: none"> • Finalize Documentation • Deploy CounselCare System for Operational Use 	<ul style="list-style-type: none"> • Complete and organize project documentation • CounselCare system released

3.2 User Requirement Analysis

Table 3 *User Requirement*

No	User Requirements
1.	The student should be able to input their IC number and password to log in to the system.
2.	The student should be able to view the home page that showcases an overview of the assessment and click a button to initiate the assessment.
3.	The student should be able to view and answer assessment questions.
4.	The student should be able to submit their responses and look at the result of their assessments.
5.	The student should be able to change the account password.

Table 3: *(cont)*

6.	The student should be able to reset the account password if they forgot password.
7.	The student should be able to log out of the system.
8.	The counsellors should be able to input their IC number, role, and password to log

- in to the system.
9. The counsellors should be able to manage assessment questions based on depression, anxiety, and stress categories
 10. The counsellors should be able to enable or disable students' access to assessments.
 11. The counsellors should be able to view insights summarization from students' mental health assessments on dashboard.
 12. The counsellors should be able to manage cases based on assessment results, categorized into unanswered, passed, intervention, second passed, and second intervention.
 13. The counsellors should be able to create intervention appointments' date and time for students who obtain moderate, severe, or very severe level on the first assessment.
 14. The counsellors should be able to allow students to retake second assessment post-intervention.
 15. The counsellors should be able to change the account password.
 16. The administrator should be able to log in to the system.
 17. The counsellors should be able to reset the account password if they forgot password.
 18. The counsellors should be able to log out of the system.
 19. The administrator should be able to input their IC number, role, and password to log in to the system.
 20. The administrator should be able to manage psychologists.
 21. The administrator should be able to manage accounts for counsellors and students.
 22. The administrator should be able to change the account password.
 23. The administrator should be able to reset the account password if they forgot password.
 24. The administrator should be able to log out of the system.

3.3 Functional and Non-functional Requirements

Functional requirements are crucial for establishing software system or component functions and capabilities. It helps requirement analysis by uncovering system design omissions, ensuring a complete and effective solution. The non-functional requirement establishes the system's core attributes and performance restrictions. These requirements are essential for software usability and efficacy.

Table 4 *Functional Requirements*

No	Modules	Description
1.	Login	<ul style="list-style-type: none"> • The system should allow administrators, counsellors, and students to have unique accounts for logging in. • The system should allow users to log in by entering their identification card number, role (for administrator and counsellor), and password. • The system should allow users to update password. • The system should allow users to reset password by clicking "forgot password". • The system should allow secure storage and validation of passwords.

Table 4: (cont)

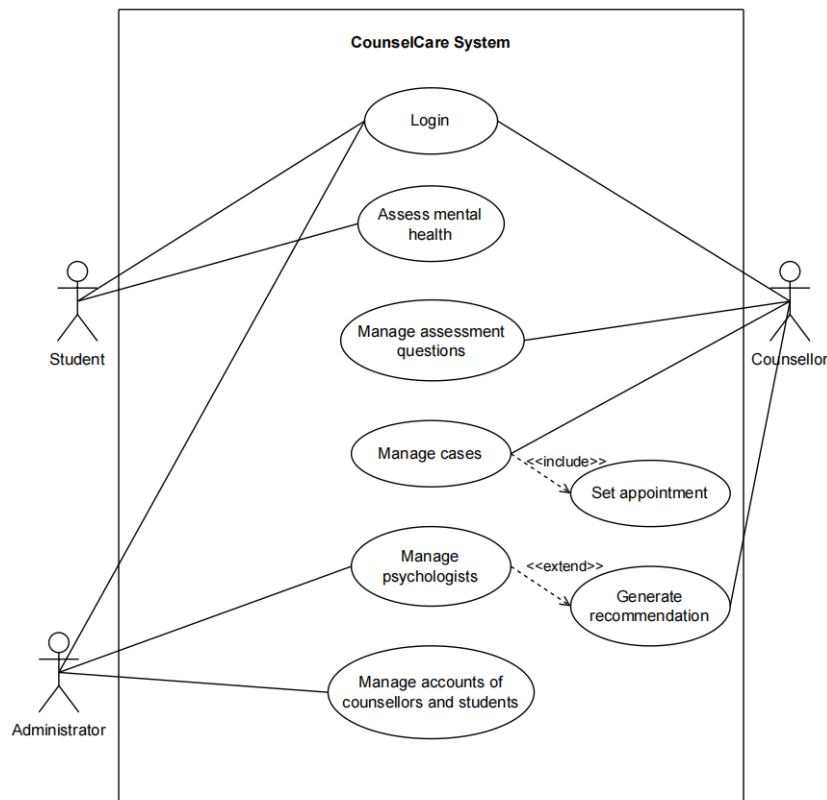
2.	Assess mental health	<ul style="list-style-type: none"> • The system should allow students to view an interact with assessment questions. • The system should allow students to select an answer to each of the questions. • The system should allow students to submit their answers and display their assessment results. • The system should allow students to view their obtained results and screening score reference. • The system should display prompt to alert for intervention appointment email if high levels are achieved. • The system should allow second assessment if allowed by counsellor.
3.	Manage assessment questions	<ul style="list-style-type: none"> • The system should allow counsellors to manage assessment questions based on depression, anxiety, and stress categories through Create, Read, Update, and Delete (CRUD) operations. • The system should allow counsellors to enable or disable assessment access.
4.	Manage cases	<ul style="list-style-type: none"> • The system should allow counsellors to manage cases based on assessment results, categorized into unanswered, passed, intervention, second passed, and second intervention. • The system should allow counsellors to create intervention appointments' date and time for students who obtain moderate, severe, or very severe level on the first assessment. • The system should automatically send email notifications to students regarding their appointments. • The system should enable counsellors to allow students to retake second assessment post-intervention. • The system should allow counsellor to assign a psychologist to students who obtain moderate, severe, or very severe level on the second assessment and generate a referral letter to the psychologist for their parents.
5.	Manage psychologists	<ul style="list-style-type: none"> • The system should allow administrators to manage psychologists' information through Create, Read, Update, and Delete (CRUD) operations.
6.	Manage accounts of students and counsellors	<ul style="list-style-type: none"> • The system should allow administrators to manage school counsellors' and students' accounts through Create, Read, Update, and Delete (CRUD) operations.

Table 5 Non-functional Requirements

No	Requirements	Description
1.	Usability	<ul style="list-style-type: none"> The system must be designed to be user-friendly, ensuring ease of use and comprehension for all users.
2.	Security	<ul style="list-style-type: none"> The system ensures that access is restricted to users with valid IC number and passwords, ensuring secure authentication.
3.	Compatibility	<ul style="list-style-type: none"> The system should be compatible with all major web browsers, ensuring accessibility and a seamless user experience.
4.	Operational	<ul style="list-style-type: none"> The system should have the capability to establish a connection to the internet, facilitating its operational functionality.
5.	Performance	<ul style="list-style-type: none"> The system mandates that the operating system's response time adheres to standardized benchmarks, guaranteeing consistent and efficient performance.

3.4 Use Case Diagram

During the analysis phase, a use case diagram was constructed to provide a comprehensive perspective of the functionality and components of the CounselCare system. The diagram serves as a helpful instrument in system analysis by facilitating the identification, clarification, and organisation of the system requirements. It graphically depicts the correlation between characters, such as the Administrator, Counsellor, and Student, and the system, providing a concise overview of essential details. Fig. 2 depicts the primary components of the UML Use Case Diagram for the CounselCare system.

**Fig. 2** Use Case Diagram

3.5 Class Diagram

Class diagrams are crucial for determining the properties and methods that will be used in the planned application. They have a crucial function in establishing the relationships between classes, and their specifics may be expanded upon using sequence diagrams. The given class diagram conforms to object-oriented concepts and is useful across many stages of a project, such as analysis, design, and implementation. Class diagrams are an essential component in the creation of this system. Fig. 3 displays the class diagram for the CounselCare system.

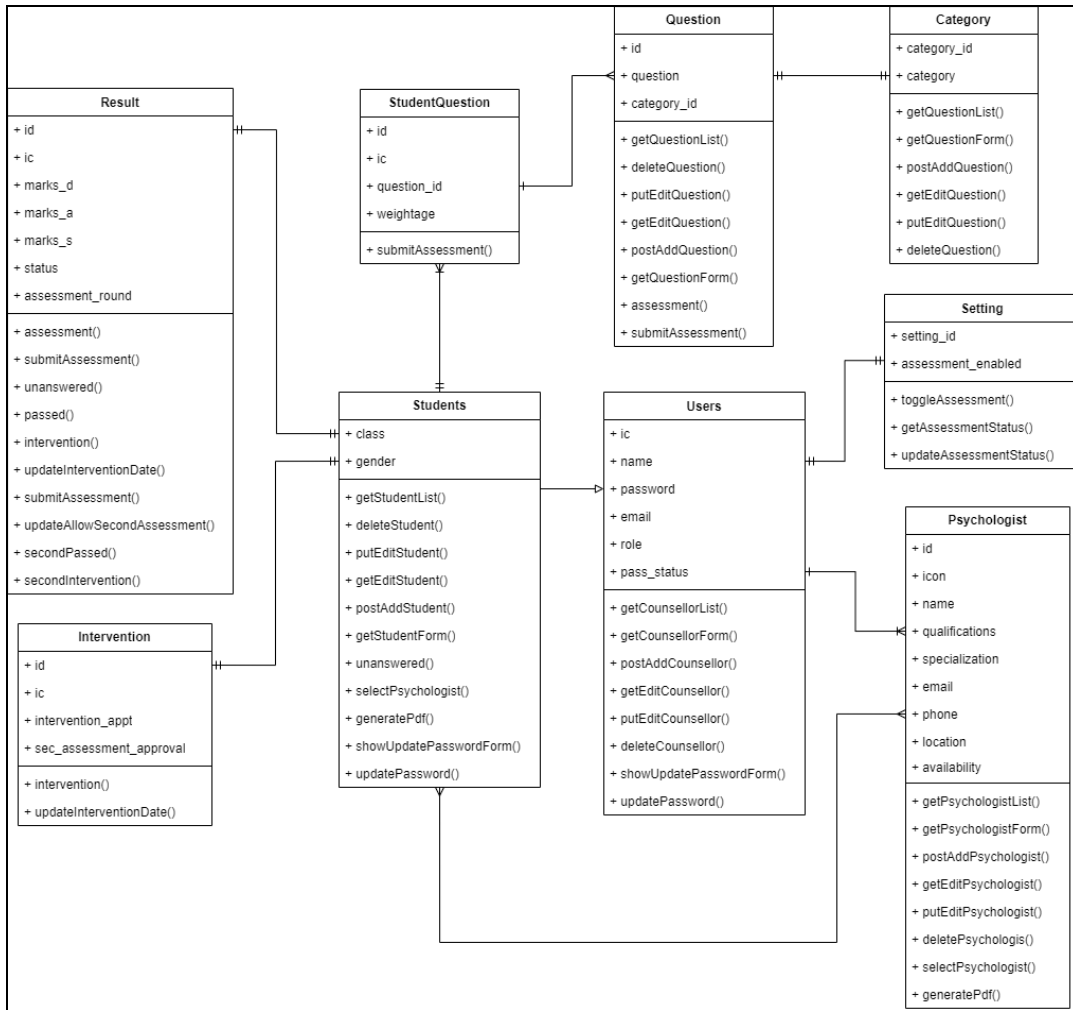


Fig. 3 Class Diagram

3.6 User Interface Design

Interface design is the deliberate and systematic creation of user interfaces for software or automated devices, with a primary focus on the visual appeal and overall style. The system interface plays a crucial role in facilitating user interaction and enhancing system usability.

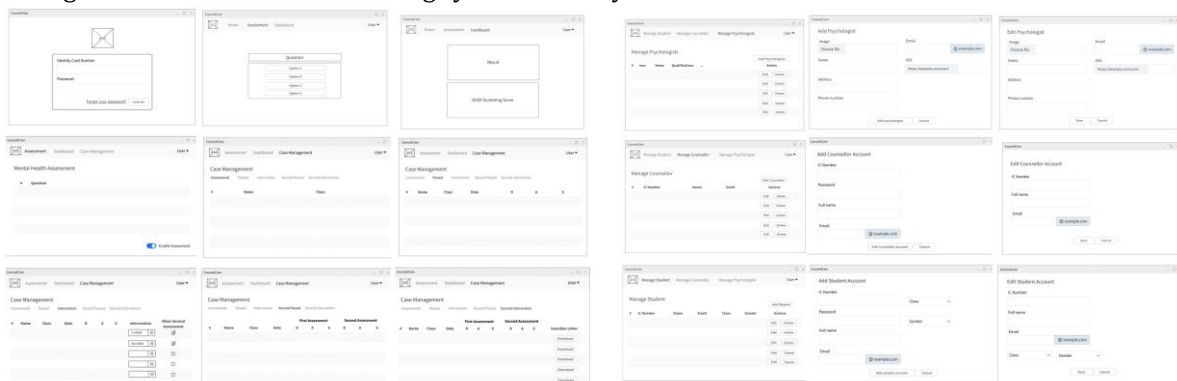


Fig. 4 Wireframe

3.7 Implementation of the System

In the implementation phase, a working prototype of the system is constructed according to the detailed specifications obtained from earlier stages. This phase includes setting up the development environment and writing the necessary code to realize the system's functionalities. It is important to monitor progress closely to ensure that the project stays on track and aligns with the established requirements.



Fig. 5 Login for (a) Administrator and Counsellor; (b) Student Interface

Fig. 5(a) showcases the login interface designed for administrators and counsellors, ensuring that only authorized personnel can enter the system. Similarly, Fig. 5(b) presents the login interface tailored for students.

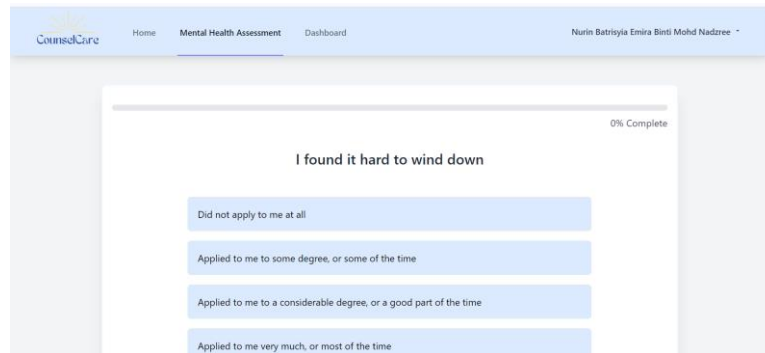


Fig. 6 Assess Mental Health Assessment Interface

Dashboard

Result					
Depression	Anxiety	Stress			
Normal Risk	Normal Risk	Normal Risk			
Category	Total Score	Severity Level			
Depression	3	Normal			
Anxiety	3	Normal			
Stress	5	Normal			
Screening Score Reference					
Category	Normal	Mild	Moderate	Severe	Very Severe
Depression	0 - 5	6 - 7	8 - 10	11 - 14	15+
Anxiety	0 - 4	5 - 6	7 - 8	9 - 10	11+
Stress	0 - 7	8 - 9	10 - 13	14 - 17	18+

Fig. 7 Assess Mental Health Result Interface

The Assess Mental Health Module is an essential component designed to evaluate students' mental health. Fig. 6 displays the interfaces where students can complete their assessments. These interfaces are developed to be user-friendly and comprehensive, ensuring that students can easily navigate and provide the necessary information. Following the assessment, the results are processed and displayed as illustrated in Fig. 7.

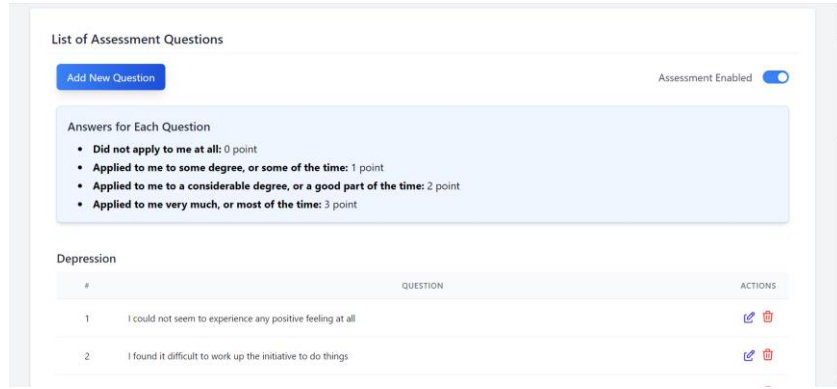


Fig. 8 Manage Assessment Questions Interface

Fig. 8 illustrates the interface for counsellors to manage assessment questions. This module provides functionalities for adding, editing, and deleting assessment questions, ensuring that the content remains relevant and up to date.

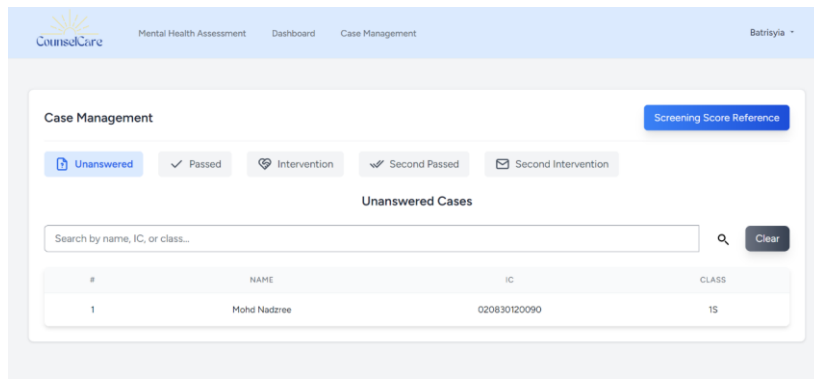


Fig. 9 Manage Cases Unanswered Interface

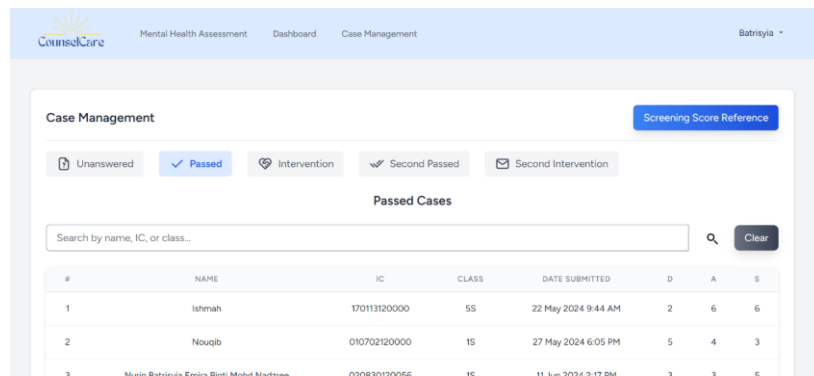


Fig. 10 Manage Cases Passed Interface

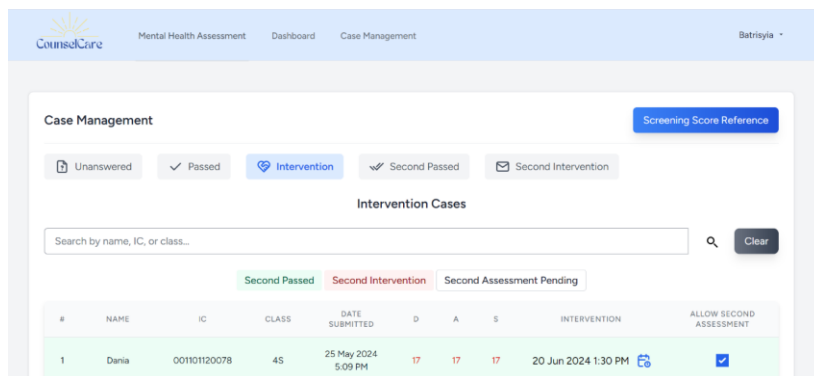


Fig. 11 Manage Cases Intervention Interface

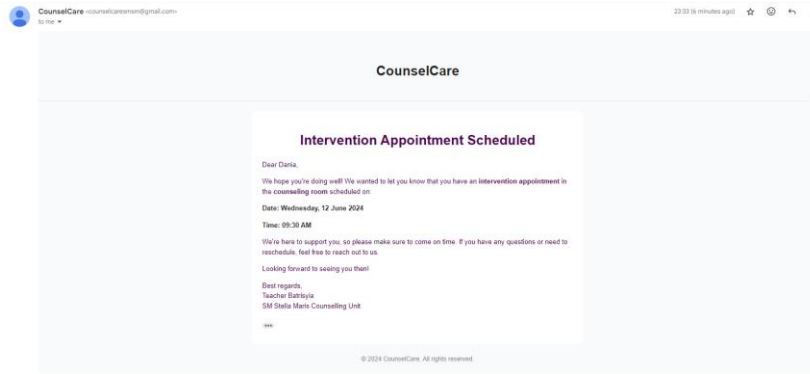


Fig. 12 Intervention Appointment Email Notification

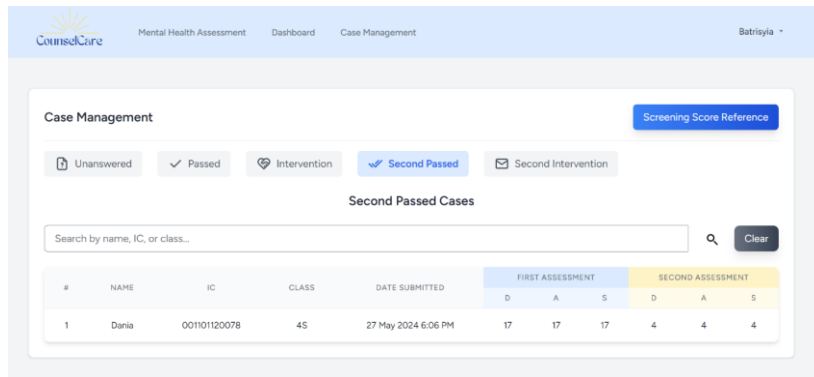


Fig. 13 Manage Cases Second Passed Interface

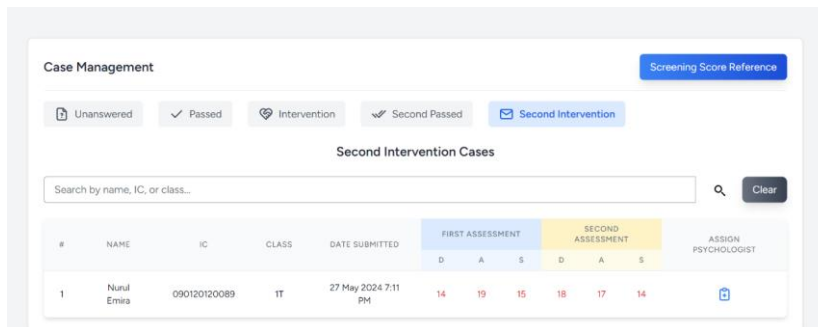


Fig. 14 Manage Cases Second Intervention Interface

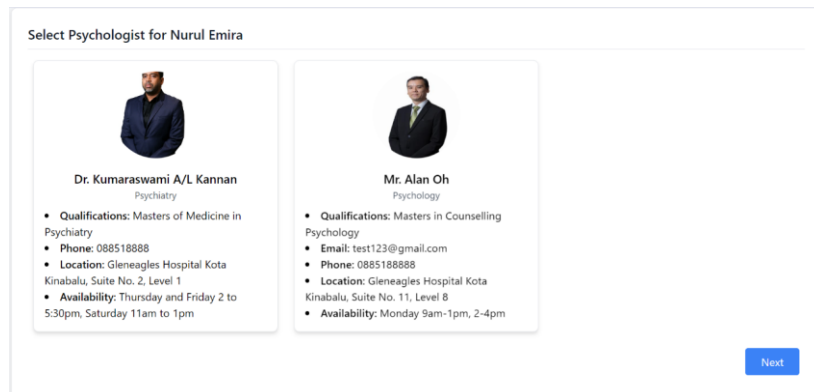


Fig. 15 Assign a Psychologist for Second Intervention Cases

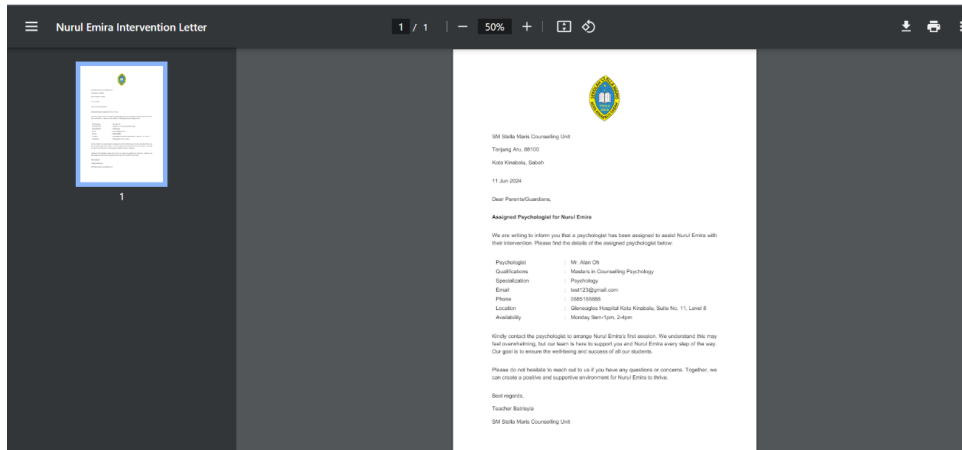


Fig. 16 Generated PDF Referral Letter

Fig. 9 through Fig. 16 show different states of case management, including unanswered cases, passed cases, intervention cases, second passed cases, and second intervention cases. This module provides a comprehensive view of all cases, enabling counselors to prioritize and address each case based on its status. In intervention cases, counselors can set an intervention appointment date. In second intervention cases, counselors can assign a psychologist and generate a PDF referral letter for the students' parents.

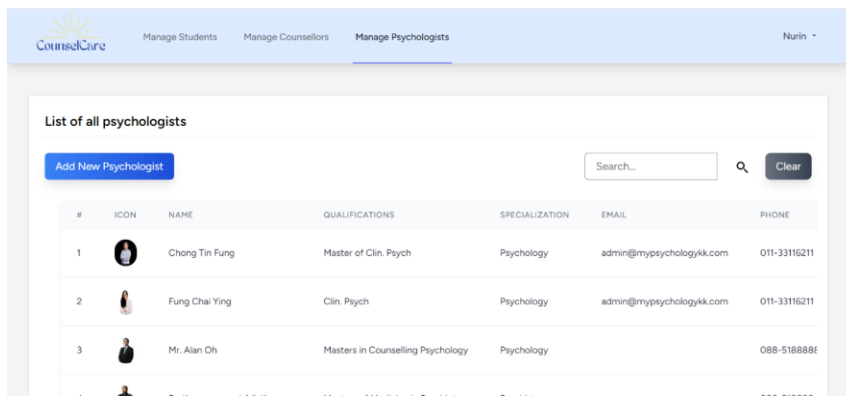


Fig. 17 Manage Psychologists Interface

The Manage Psychologists Module, as illustrated in Fig. 17, allows administrators to manage the profiles of psychologists. This module includes functionalities for creating and updating psychologist profiles, managing their availability.

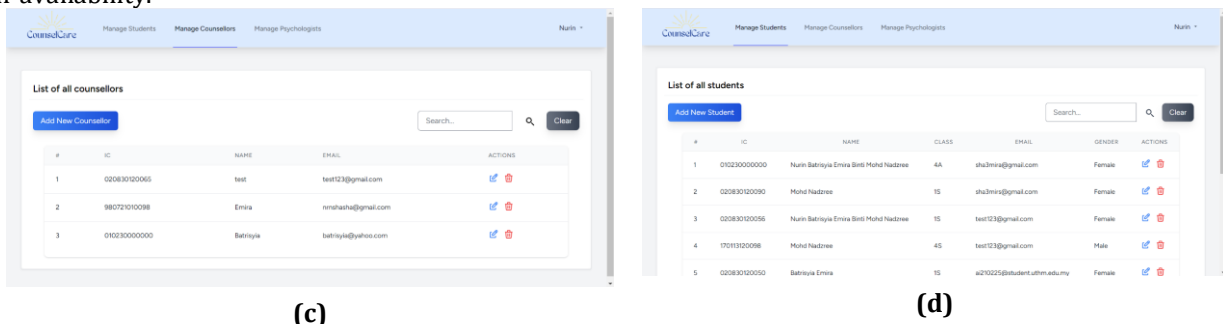


Fig. 18 Manage Accounts of (a) Counsellors; (b) Students Interface

Fig. 18(a) and 18(b) display the interfaces for managing counsellor and student accounts, respectively. This module supports registering new users and managing existing accounts.

4. Result and Discussion

4.1 Test Plan

Based on the results presented in Table 6, the test plan for all the modules in the CounselCare system has been successfully executed without any failures. The expected results align with the actual results, indicating that the

application performed as intended during testing. Consequently, the test plan confirms that the CounselCare system encountered no errors and successfully met the functional requirements for each module.

Table 6 *Functional Testing*

Test ID	Requirement ID	Requirement	Result (Pass/Fail)
Login			
TC001-01	FR-01-01	The system verifies the entered IC number and password	Pass
TC001-02	FR-01-02	The system resets respective field if invalid IC number or password is entered	Pass
TC001-03	FR-01-03	The system should redirect validated users to their respective page based on their role.	Pass
Assess Mental Health			
TC002-01	FR-02-01	The system should allow students to view and interact with assessment questions.	Pass
TC002-02	FR-02-02	The system should allow students to submit their answers and view their results	Pass
TC002-03	FR-02-03	The system should appropriately manage and store student answers in the database	Pass
TC002-04	FR-02-04	The system should enable students to retake the assessment after the intervention and approval from counsellor	Pass
Manage assessment question			
TC003-01	FR-03-01	The system should allow counsellors to add, edit, and delete assessment questions.	Pass
TC003-02	FR-03-02	The system should categorize questions based on depression, anxiety, and stress.	Pass
TC003-03	FR-03-03	The system should update the assessment questions list in real-time.	Pass
TC003-04	FR-03-04	The system should prompt for confirmation before deleting a question.	Pass
TC003-05	FR-03-05	The system should update the accessibility of the assessment	Pass
TC003-06	FR-03-06	The system should handle and display appropriate error messages in case of system errors.	Pass
Manage cases			
TC004-01	FR-04-01	The system should allow counsellors to view a list of students' assessment results.	Pass
TC004-02	FR-04-02	The system should allow counsellors to create, edit, and manage intervention appointments.	Pass

Table 6: (cont)

TC004-03	FR-04-03	The system should automatically send email notifications to students regarding their appointments.	Pass
TC004-04	FR-04-04	The system should allow counsellors to generate and manage letters for parents of students who still obtain high scores on the second assessment.	Pass
TC004-05	FR-04-05	The system should categorize cases based on assessment results into different stages.	Pass
TC004-06	FR-04-06	The system should allow counsellors to view a list of students' assessment results.	Pass
Manage psychologists			
TC005-01	FR-05-01	The system should allow administrators to add, edit, and delete psychologists.	Pass
TC005-02	FR-05-02	The system should validate input data to prevent errors or inconsistencies during CRUD operations.	Pass
TC005-03	FR-05-03	The system should update the psychologists list in real-time.	Pass
TC005-04	FR-05-04	The system should prompt for confirmation before deleting a psychologist.	Pass
TC005-05	FR-05-05	The system should handle and display appropriate error messages in case of system errors.	Pass
Manage accounts of counsellor and students			
TC006-01	FR-06-01	The system should allow administrators to add, edit, and delete counsellors and students.	Pass
TC006-02	FR-06-02	The system should validate input data to prevent errors or inconsistencies during CRUD operations.	Pass
TC006-03	FR-06-03	The system should update the counsellors and students list in real-time.	Pass
TC006-04	FR-06-04	The system should prompt for confirmation before deleting a counsellor or student.	Pass
TC006-05	FR-06-05	The system should handle and display appropriate error messages in case of system errors.	Pass

4.2 User Acceptance Testing

User Acceptance Testing is a critical phase in software development where end-users or stakeholders evaluate the system's usability, functionality, and overall suitability for their specific needs. It is performed to ensure that the software meets the requirements and expectations of the intended users.

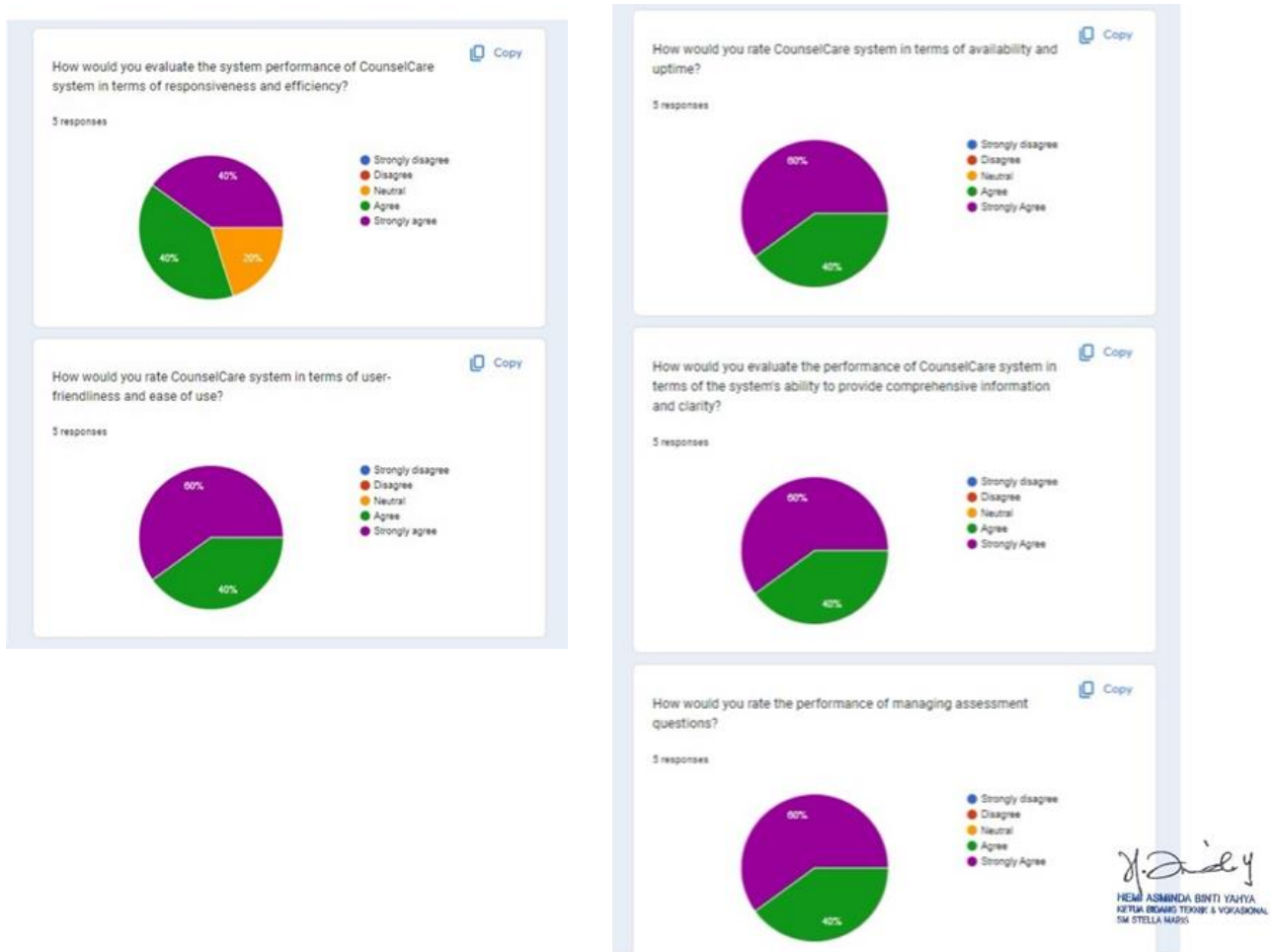
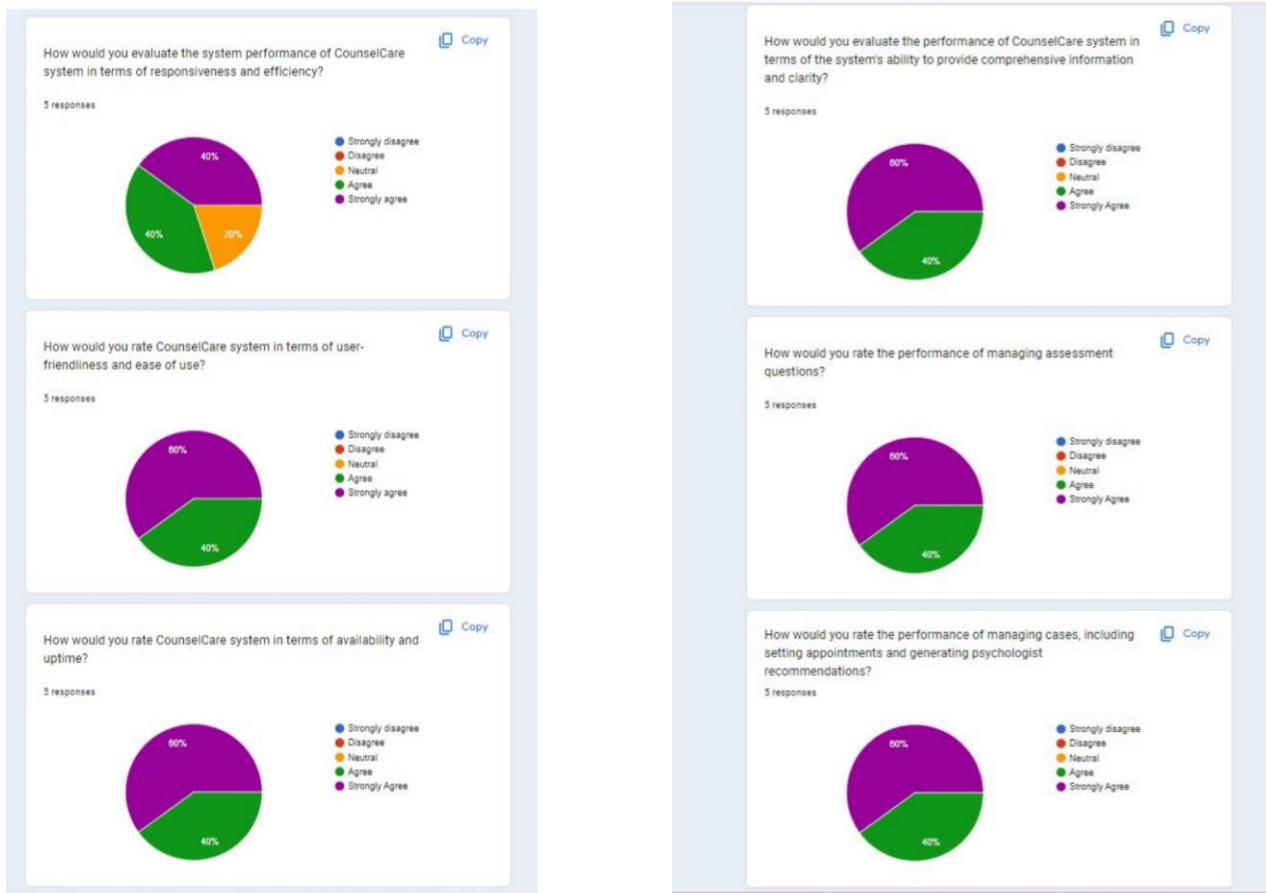


Fig. 19 User Acceptance Test Result for Administrator

Results in Fig. 19 indicate high satisfaction, with the majority of respondents rating the system positively across all metrics. Specifically, 80% of users strongly agreed on the system's user-friendliness, availability, and comprehensive information provision, while 60% strongly agreed on its responsiveness and efficiency.

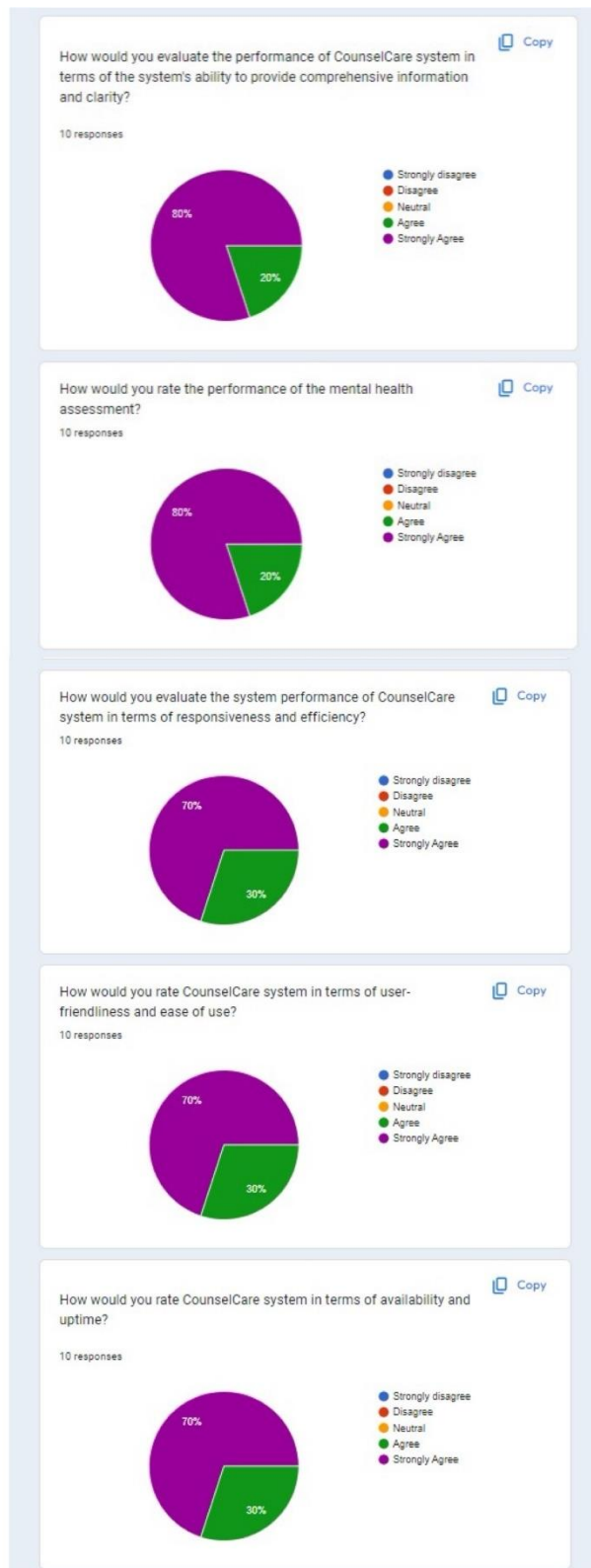


SUSANDAH SOLUDIH
Guru Bimbingan & Kaunseling
SM STella Maris

SUSANDAH SOLUDIH
Guru Bimbingan & Kaunseling
SM STella Maris

Fig. 20 User Acceptance Test Result for Counsellor

Feedback in Fig. 20 show high satisfaction across various metrics. Most counsellors strongly agree that the system is user-friendly, available, and efficient in providing comprehensive information and managing cases, with 60% of respondents strongly agreeing in these categories. Additionally, the system's performance in responsiveness, managing assessment questions, and setting appointments received strong positive feedback, indicating overall effectiveness and reliability.



SUSANNAH SOLUDIH
Guru Bimbingan & Kaunseling
SM STella Maris

Fig. 21 User Acceptance Test Result for Student

Results in Fig. 21 show exceptional satisfaction across all metrics. A significant 70% to 80% of students strongly agree that the system is responsive, user-friendly, available, and provides comprehensive information and clarity, with no negative feedback. Additionally, 80% of students strongly agree on the effectiveness of the mental health assessment feature.

5. Conclusion

In conclusion, the developed system provides considerable advantages, including convenience, decreased workload, better relationships, and improved mental health care, which together enhance the counselling process at SM Stella Maris. Nonetheless, there are aspects that could be improved, such as creating a mobile version, reducing reliance on internet connectivity, offering more customization options, enhancing offline functionality, and allowing counsellors to insert the treatments for each patient. Addressing these areas will further improve the system's performance and user satisfaction.

Acknowledgement

The authors would like to thank the Faculty of Computer Science and Information Technology, Universiti Tun Hussein Onn Malaysia for its support.

Conflict of Interest

Authors declare that there is no conflict of interests regarding the publication of the paper.

Author Contribution

The author confirms sole responsibility for the following: study conception and design, data collection, analysis and interpretation of results, and manuscript preparation.

Appendix A: Signed DASS-21 Form

SMS

SARINGAN MINDA SIHAT

Nama : _____
 I/C No. : _____
 Jantina : _____
 Umur : _____
 Bangsa : _____
 Pekerjaan : _____
 No. Telefon : _____
 Tarikh : _____

Cerakan keratan ini untuk disimpan oleh klien.

KEPUTUSAN SARINGAN MINDA SIHAT

Nama : _____ Tarikh : _____
 Jantina : Lelaki/Perempuan Umur : _____

Ujian	Keputusan		
	Stres	Anzieti	Kemurungan
DASS			

*BERANAK SOLIHIN
 Guru Bimbingan & Kaunseling
 Bilik 2104*

SMS 1

SARINGAN MINDA SIHAT

SOAL SELIDIK DASS

Langkah 1 : Sila baca dan jawab soal selidik DASS.
 Langkah 2 : Masukkan skala markah jawapan ke dalam ruangan kosong dibahagian 2, mengikut soalan (5 bagi setiap kategori Stres, Anzieti, dan Kemurungan).
 Langkah 3 : Jumlahkan skala markah bagi setiap kategori bagi mengetahui tahap status kesihatan mental anda.
 Langkah 4 : Sila rikan keputusan dalam bahagian 3 dan rikan dalam keratan di muka hadapan.

BAHAGIAN 1

Sila baca setiap pernyataan di bawah dan **bedakan** jawapan anda pada setiap pernyataan jawapan 0, 1, 2 atau 3 bagi menggambarkan keadaan anda sepanjang minggu yang lalu. Tulis jawapan yang betul atau salah. Jangan mengaitkan masa yang terlalu lama untuk mengambil masa-masa keputusan. Please read each statement and circle number 0, 1, 2 or 3 which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

0 = Tidak Lajung menggambarkan keadaan saya
 Did not apply to me at all
 1 = Sedikit atau jarang-jarang menggambarkan keadaan saya
 Applied to me to some degree, or some of the time
 2 = Banyak atau kerap menggambarkan keadaan saya
 Applied to me to a considerable degree, or a good part of time
 3 = Sangat banyak atau sangat kerap menggambarkan keadaan saya
 Applied to me very much, or most of the time

1. Saya dapat diri saya sukar diantarkan I found it hard to get on	0	1	2	3
2. Saya sedia mudi saya terasa boring I am aware of myself of my mouth	0	1	2	3
3. Saya tidak dapat merasakan perasaan positif sama sekali I don't seem to experience any positive feeling at all	0	1	2	3
4. Saya mengalami kesulitan bernafas (contohnya pernafasan yang laju, pencungap-cungap, sesak nafas) apabila melakukan sesuatu perkara I experienced breathing difficulty (eg, unusually rapid breathing, breathlessness) in the absence of physical exertion	0	1	2	3
5. Saya sukar untuk mendapatkan semangat bagi melakukan sesuatu perkara I am unable to get going or motivated to do things	0	1	2	3
6. Saya cenderung untuk bertindak berlebihan dalam sesuatu keadaan I tended to over-react to situations	0	1	2	3
7. Saya rasa mengagut (contohnya pada tangan) I experienced trembling (eg, in the hand)	0	1	2	3
8. Saya rasa saya mengalami banyak tenaga dalam keadaan biasa I felt that I had a lot of nervous energy	0	1	2	3
9. Saya berfikir mengenai perkara yang mungkin menjadi panik dan melakukan perkara yang membahayakan diri sendiri I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10. Saya rasa saya tidak membara apabila untuk dibangkitkan I felt that I had nothing to look forward to	0	1	2	3
11. Saya dapat diri saya semakin gelisah I found myself getting aggrivated	0	1	2	3
12. Saya rasa sukar untuk tenang I found it difficult to relax	0	1	2	3
13. Saya rasa sedih dan murung I felt down hearted and blue	0	1	2	3
14. Saya tidak dapat memfokus perhatian dengan perkara yang menghalang saya memusatkan apa yang saya lakukan I was incapable of anything that kept me from getting on with what I was doing	0	1	2	3
15. Saya rasa hampir-hampir menjadi panik/terseka I felt I was close to panic	0	1	2	3
16. Saya tidak bersemangat dengan apa-apa yang saya lakukan I was unable to become enthusiastic about anything	0	1	2	3
17. Saya rasa saya tidak bersemangat sebagai seorang individu I felt I wasn't worth much as a person	0	1	2	3
18. Saya rasa saya mudah terkejut I felt that I was rather touchy	0	1	2	3
19. Saya sedang tidak yakin tentang saya walaupun tidak melakukan aktiviti fizikal (contohnya keluar berjalan-jalan, bersepeda, atau berjalan-jalan bersepeda) I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart pounding, etc)	0	1	2	3
20. Saya bimbang tanpa sebab yang munasabah I felt worried without any good reason	0	1	2	3
21. Saya rasa tidak ada tenaga I felt that I was weary/tired	0	1	2	3

*BERANAK SOLIHIN
 Guru Bimbingan & Kaunseling
 Bilik 2104*

BAHAGIAN 2

Panduan Mengira Skor -
 Masukkan skala markah jawapan bagi soalan (5) bagi setiap kategori.

STRES								
Soalan	S1	S6	S8	S11	S12	S14	S18	Jumlah
Markah								

ANZIETI								
Soalan	S2	S4	S7	S9	S15	S19	S20	Jumlah
Markah								

KEMURUNGAN (DEPRESSION)								
Soalan	S3	S5	S10	S13	S16	S17	S21	Jumlah
Markah								

Selepas dijumlahkan, sila rikan kepada petak skor saringan dan terjemahkan jumlah skor untuk mengetahui tahap status kesihatan mental anda.

SKOR SARINGAN			
	Kemurungan	Anzieti	Stres
Normal	0 - 5	0 - 4	0 - 7
Ringan	6 - 7	5 - 6	8 - 9
Sederhana	8 - 10	7 - 8	10 - 13
Teruk	11 - 14	9 - 10	14 - 17
Sangat Teruk	15 +	11 +	18 +

Ikan keputusan (normal, ringan, sederhana, teruk atau sangat teruk) dalam jadual di bawah:

KEPUTUSAN UJIAN DASS

Ujian	Tahap
Stres	
Anzieti	
Kemurungan	

SKOR DASS

*BERANAK SOLIHIN
 Guru Bimbingan & Kaunseling
 Bilik 2104*

References

- [1] G. J. Westerhof and C. L. M. Keyes, "Mental illness and mental health: the two continua model across the lifespan," *Journal of Adult Development*, vol. 17, no. 2, pp. 110–119, Aug. 2009, doi: 10.1007/s10804-009-9082-y.
- [2] S. H. Lovibond and P. F. Lovibond, *Manual for the Depression Anxiety Stress Scales*, 2nd ed. Sydney: Psychology Foundation, 1995.
- [3] M. A. Bentley, J. Mac Crawford, J. R. Wilkins, A. R. Fernandez, and J. R. Studnek, "An assessment of depression, anxiety, and stress among nationally certified EMS professionals," *Prehospital Emergency Care*, vol. 17, no. 3, pp. 330–338, Feb. 2013, doi: 10.3109/10903127.2012.761307.
- [4] L. Parkitny and J. McAuley, "The Depression Anxiety Stress Scale (DASS)," *Journal of Physiotherapy*, vol. 56, no. 3, p. 204, Jan. 2010, doi: 10.1016/s1836-9553(10)70030-8.
- [5] Institute for Public Health, "National Health and Morbidity Survey 2017 (NHMS 2017): Adolescent Mental Health (DASS-21)."
- [6] F. Gomez, "A Guide to the Depression, Anxiety and Stress Scale (DASS 21)," <https://proceduresonline.com/trixcms2/media/11957/depression-anxiety-and-stress-scale-dass21.pdf>
- [7] "Free Mental Health Assessment | DASS-21 | Naluri." <https://campaign.naluri.life/dass-21>
- [8] "Depression Anxiety and Stress Scale 21 (DASS-21) – HealthFocus Clinical Psychology Services." <https://www.healthfocuspsychology.com.au/tools/dass-21/>
- [9] "DASS-21 (Depression Anxiety Stress Scale-21)." <https://www.icliniq.com/tool/dass-depression-anxiety-stress-scale-21>
- [10] T. S. Jones and R. C. Richey, "Rapid prototyping methodology in action: A developmental study," *Educational Technology Research and Development*, vol. 48, no. 2, pp. 63–80, Jun. 2000, doi: 10.1007/bf02313401.