User Menu

1. Overview

Assessment of Negative Symptoms(SANS) and Assessment of Positive Symptoms(SAPS) were developed in 1980 to measure the severity of negative and positive symptoms effectively. They are frequently used in clinical and research settings. The study by Suneeta stated that the SANS is the most widely used scale to help the clinician track treatment progress, and it is often used with SAPS. The SANS consists of 25 items, and the SAPS consists of 34 items, each taking approximately 30 mins to administrate.

Time constraints often limit the implementation of research and clinical testing methods involving extensive questionnaires, and SANS and SAPS are the most time-consuming compared to others(Kumari et al., 2017). Additionally, comprehensive questionnaires in psychiatric assessments usually decrease accuracy as patients' attention wanes((Frey & Edwards, 2011)). The efficient Assessment System for SAPS and SANS rating scales(EASY-SAPS/SANS) offers a promising solution by reducing measurement length to enhance efficiency.

EASY-SAPS/SANS is a tool to predict and classify the total score of SAPS/SANS rating scales with fewer items(questions) and shortened time. We develops and tests an algorithm and deploys this tool for conducting CAT using the GRM IRT model on SANS and SAPS.

The development and calibration study of the algorithm included 457 patients with schizophrenia. We split the data into 90% training and 10% testing ten times, with the test sets being unique for 10-fold cross-validation. Validation revealed a correlation of r = 0.96 between the predicted and actual scores and a mean absolute error of 8.79, using an average of 19 out of 50 questions. With a predefined threshold for classification, we improved the average accuracy to 97.31%. The accuracy of the classification of the patient’s total score from above or below 37(the median of the total score for all the participants) is 89.64%.

Here is a demonstration to help the user understand the usage of the application.

As you can see in Figure 1, the interface comprises a menu bar located on the left-hand side, offering options 'Predict,' 'Classify,' and 'About.' Upon website opening, the default view is the 'Predict' page. This page features two columns containing SAPS and SANS questions with their categories, names, selection choices and two graphs, respectively.

Initially, the default choice is set to '0,' and the corresponding graphs representing SAPS and

SANS scores remain unpopulated. As you proceed to select specific answers to the questions, you will observe dynamic changes in the graphs, accompanied by corresponding results of the predicted score. To hide the sidebar, you may click on the icon located beside the website's name at the top.

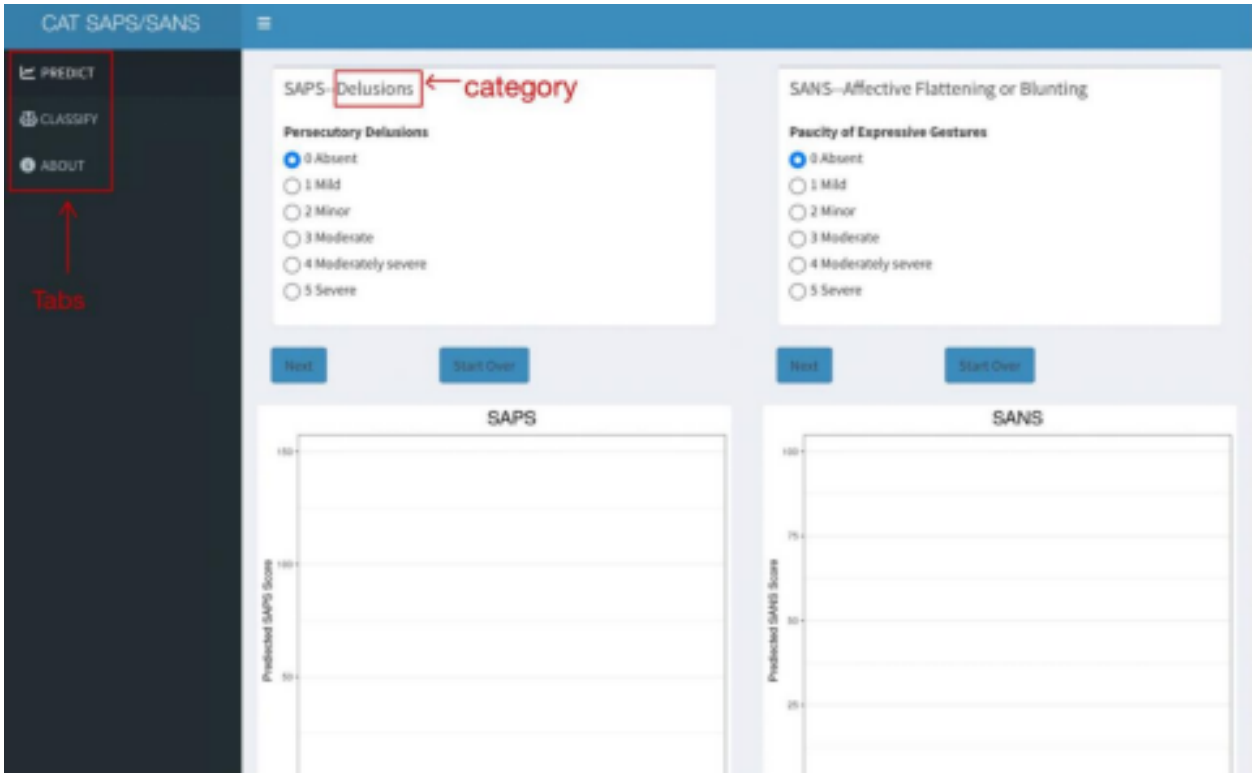

Figure 1. Overview

1.1 PREDICT Page

Originally, to get the SANS score, researchers had to answer each of the 20 questions(excluding Global Rating questions) and then sum it together. For the SAPS score, there will be 30 questions. And for the total score, all 50 questions need to be answered and summed together.

For the prediction task, based on the computational adaptive test algorithm, this tool will proceed to the next item based on the previous answers the user provided to predict the scores (either SAPS or SANS or Total score) with as few questions as possible.

While the first question always stays the same, the subsequent questions will be generated based on the previous answers to the questions. After completing each question, you may proceed by clicking the 'Next' button. This action will prompt the graph to dynamically adjust

based on your response to show the predicted scores, subsequently generating a corresponding list populating the history of items asked by the tool and responses given by the user to each item(Figure 2). Each answer provided will generate a plotted point on the graph showing what the current predicted score is. After you input more than one question, the plotted points will be connected to form a comprehensive visual representation. Furthermore, you will notice that there will be a purple band around each point, indicating the standard error of each prediction.

Figure 2. Graph with a list of questions answered

Figure 3. Graph and list after finishing

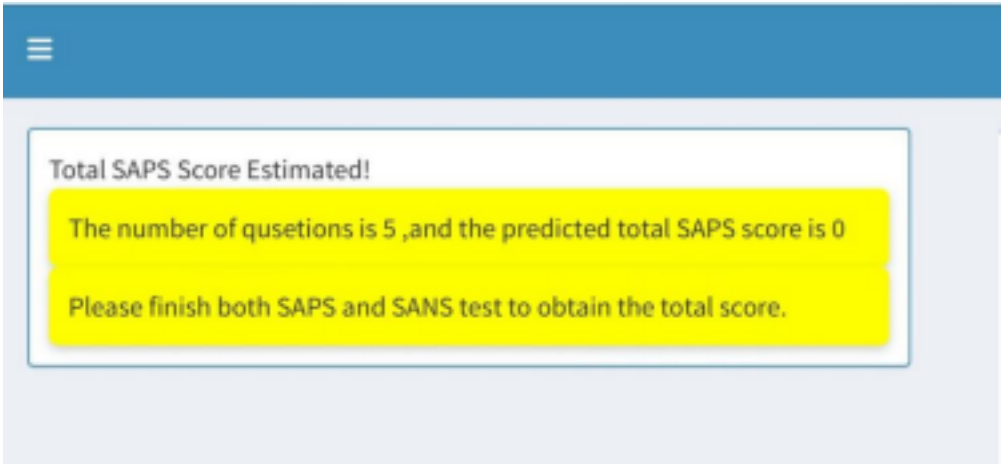

Figure 4. The result of each category

After you have completed all the questions required by the system, the 'Next' button will no longer be visible(Figure 3). You can now get your estimated score with information at the top of the page (Figure 4). If you wish to restart from the beginning, you can click the 'start over ' button. You may also utilize this button mid-selection. In such an instance, the graph and list will be reset to their initial state, devoid of any items, which is the same as Figure 1.

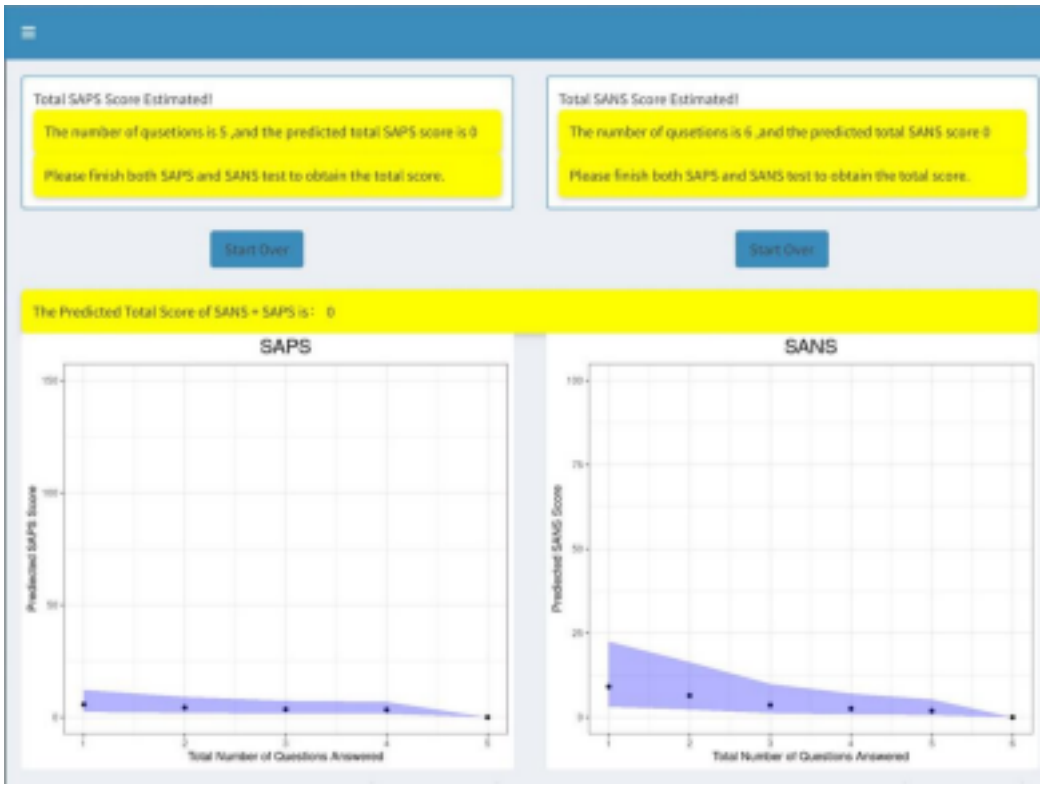

Figure 5. Final result

The predicted Total Score will be displayed only after completing the SAPS and SANS assessments (refer to Figure 5).

1.2 CLASSIFY Page

For the classification task, it will ask the user to input a threshold value(predefined to 37, which is the median value in the current database) first and then ask the user a series of items to classify if the user (or the patient) has a total score (SAPS + SANS score) that is greater or less than the threshold value, thus to classify patients based on the severity of their psychopathology - mildly ill vs severely ill. Compared to the prediction task, this is more of a quick screen for the score range rather than trying to predict the exact score. Unfortunately, our tool currently only supports total scores for the classification task. The classification for SAPS and SANS separately could be done and added in later versions.

After selecting 'CLASSIFY' from the sidebar, the corresponding page will be displayed (refer to Figure 6). Here, you can customize the threshold value according to your requirements. Subsequently, you can proceed to answer the items, generating graphs and lists like the 'PREDICT' page.

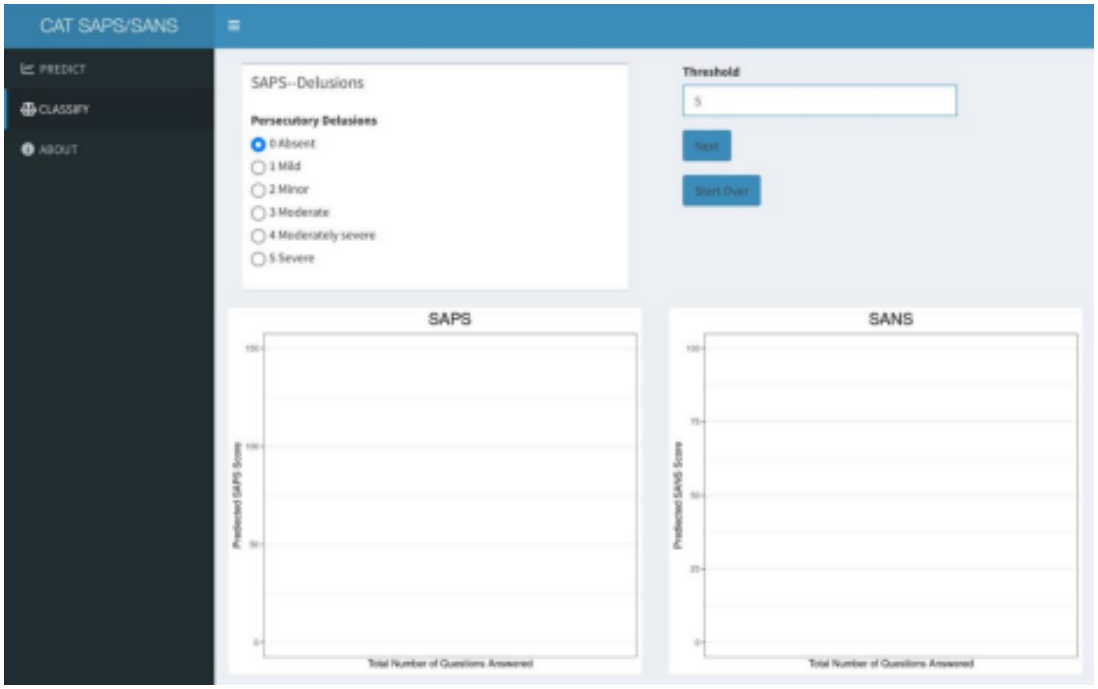

Figure 6. The main page of CLASSIFY

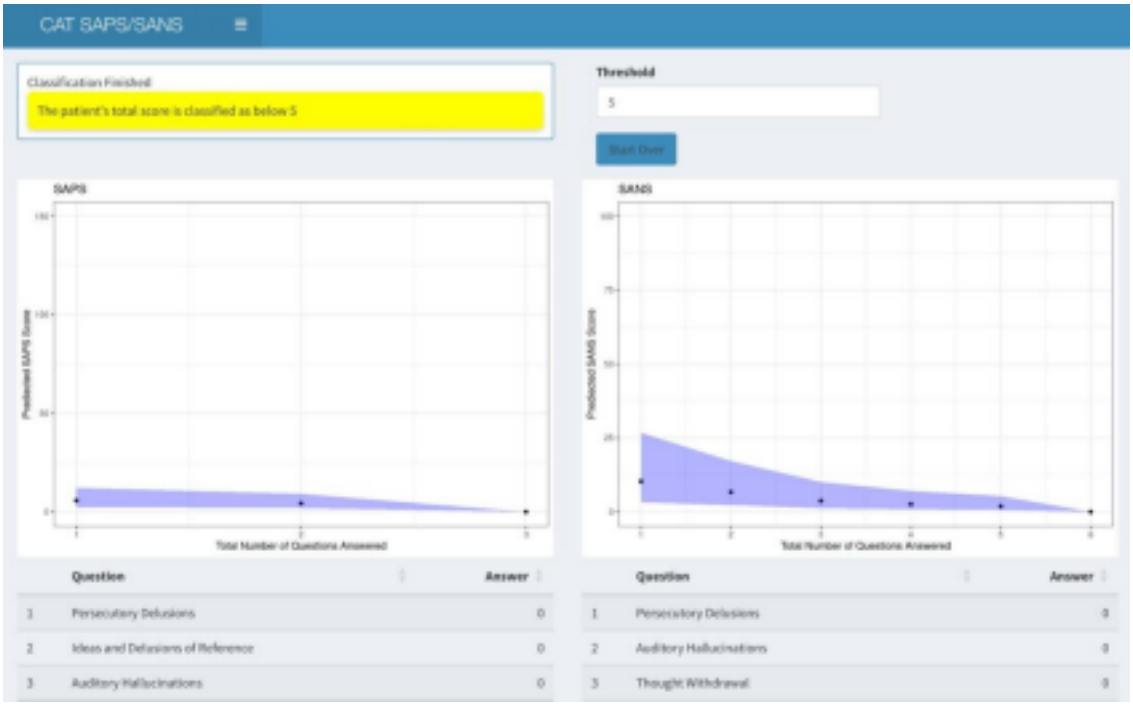

Figure 7. Result of the CLASSIFY page.

Upon completing all required items, the system will provide classification results prominently at the top of the interface with the plot and the history of items below it (refer to Figure 7).

Reference

Kumari, S., MPH, M., Malik, M., Florival, M. C., Manalai, M. P., MD, & MD, S. S. (2017a). An assessment of five (PANSS, saps, sans, NSA-16, CGI-sch) commonly used symptoms rating scales in schizophrenia and comparison to newer scales (Cains, BNSS). *Journal of Addiction Research & Therapy*, *08*(03). https://doi.org/10.4172/2155-6105.1000324

Frey, B., & Edwards, L. (2011). Strong words or moderate words: A comparison of the reliability and validity of responses on Attitude Scales. *Psychology*, *02*(01), 49–52. https://doi.org/10.4236/psych.2011.21008