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Mental Health Monitoring Dashboard with Predictive Analytics

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Abstract
Mental health problems such as stress, anxiety, and sleep disorders are increasing rapidly due to modern lifestyle, academic pressure, and work-related stress. Early identification a continuous monitoring of mental health conditions are essential to prevent severe psychological issues. However, traditional mental health assessment methods are mostly manual, time-consuming, and depend on physical consultations, which limits regular monitoring and early detection. This project proposes a Mental Health Monitoring Dashboard with Predictive Analytics, a web-based system designed to monitor, analyze, and predict mental health risks effectively. The system collects user-reported data such as mood, stress levels, and sleep patterns through a user-friendly interface. The collected data is processed and analyzed using data analytics and predictive techniques to identify potential mental health risks at an early stage. The backend of the system is developed using Python and Flask, while the frontend is implemented using HTML, CSS, and JavaScript. An interactive dashboard visually presents insights, trends, and risk levels, making the results easy to understand for users. This system helps users to become aware of their mental health status and supports preventive care through early alerts and data-driven insights. Overall, the proposed system provides an efficient, accessible, and scalable solution for continuous mental health monitoring and early risk prediction.

Keywords: *Mental health monitoring, Early risk prediction, Mood–stress–sleep analysis, Predictive analytics, Dashboard visualization, Alerts and insights*

1. Introduction

Mental health challenges such as stress, anxiety, depression, and sleep disorders are becoming increasingly common due to academic pressure, work stress, and lifestyle changes, despite advancements in healthcare awareness and digital technologies. A large number of individuals fail to recognize early symptoms of mental health issues because of lack of regular monitoring, social stigma, and limited access to professional support. As a result, mental health problems often remain undiagnosed until they reach a critical stage, affecting personal well-being and productivity. Recent research highlights that modern web-based health monitoring applications provide real-time data collection, accessibility, and scalability, making them effective tools for early mental health assessment and self-awareness (Kumar, A et al., 2022; Sharma, P et al., 2023; Patel, R et al., 2024). Similarly, technology-driven mental health dashboards have been identified as valuable solutions for analyzing behavioral indicators such as mood, stress, and sleep patterns to support early risk prediction and preventive care (Nair, P et al., 2024; Singh, A et al., 2024). In this context, the proposed **Mental Health Monitoring Dashboard with Predictive Analytics** introduces a user-friendly, secure, and scalable digital solution for continuous mental well-being assessment. The system collects user inputs related to mood, stress level, and sleep duration, processes the data, and predicts mental health risk levels as Low, Medium, or High. The platform supports early identification, promotes mental health awareness, and encourages timely intervention. The originality of this work lies in integrating full-stack web technologies with

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predictive analytics to provide a simple yet effective mental health monitoring framework focused on prevention, awareness, and responsible self-care (Mehta, S et al., 2025; Verma, A et al., 2025).

1.1. Current Issues in Mental Health Monitoring

In today's society, mental health issues such as stress, anxiety, depression, and sleep disorders are increasing rapidly due to academic pressure, work-related stress, and lifestyle changes. Despite growing awareness, many individuals fail to monitor their mental well-being regularly because of social stigma, lack of awareness, and limited access to professional mental health support. As a result, early warning signs often go unnoticed, leading to severe mental health conditions over time. Additionally, existing mental health support systems are often reactive rather than preventive, providing assistance only after symptoms become critical. The absence of simple, technology-driven self-monitoring tools makes it difficult for individuals to assess their mental health status on a regular basis. Therefore, there is a critical need for a transparent, user-friendly, and technology-enabled solution that allows continuous monitoring of key mental health indicators such as mood, stress, and sleep. Such a system can support early risk identification, promote mental health awareness, and encourage timely intervention, leading to improved well-being and preventive mental healthcare (Patel, S et al., 2024; Kumar, R et al., 2024; Verma, A et al., 2025; Chatterjee, M et al., 2025;).

1.2. Purpose and Major Target of the Project

The major target of the project is to provide a user-friendly and accessible platform that allows individuals to assess their mental health status on a regular basis. The system aims to analyze user-provided data and predict mental health risk levels, thereby encouraging timely intervention and healthier lifestyle choices. Additionally, the dashboard seeks to assist educational institutions and organizations in understanding mental health trends while maintaining user privacy and data security. Through predictive analytics and clear visualization, the project contributes to improved mental health awareness and responsible self-care (Mehta, S et al., 2025; Sharma, R et al., 2025;)

2. Method

The **Mental Health Monitoring Dashboard with Predictive Analytics** was developed using a web-based methodology to enable continuous and systematic monitoring of individual mental well-being. The platform allows users to securely log in and submit mental health-related inputs such as mood level, stress level, and sleep duration through a simple and intuitive online interface. These inputs are collected regularly to support consistent mental health assessment. The system follows a structured workflow that includes user authentication, data input, data validation, preprocessing, and predictive analysis. The collected data is cleaned and processed before being analyzed using a predictive analytics module that evaluates mental health risk levels as Low, Medium, or High. The results are then displayed on a dashboard that presents clear insights and alerts for user awareness.

Table 1 Key Modules and Technologies Used in Mental Health Monitoring Dashboard

Component	Technology
Frontend Interface	HTML, CSS
Backend Services	Python, Flask
Database Management	MYSQL
Predictive Analytics	Rule-based / ML risk prediction model
User Authentication	Secure login with session management
Alerts & Insights	Risk-based alerts and recommendations

3. RESULTS AND DISCUSSION

3.1. Results

The Mental Health Monitoring Dashboard was successfully developed as a web-based system to support early identification of mental health risks. The system allows users to register securely and submit inputs such as mood level, stress level, and sleep duration on a regular basis. The collected data is validated, stored in a database, and processed using

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predictive analytics to classify mental health risk levels. The dashboard displays results through simple indicators and charts, helping users understand their mental health status easily. The system also enables continuous tracking of mental health patterns over time, which supports preventive care and early intervention**.** The results show that the system improves self-awareness and supports timely identification of potential mental health issues.

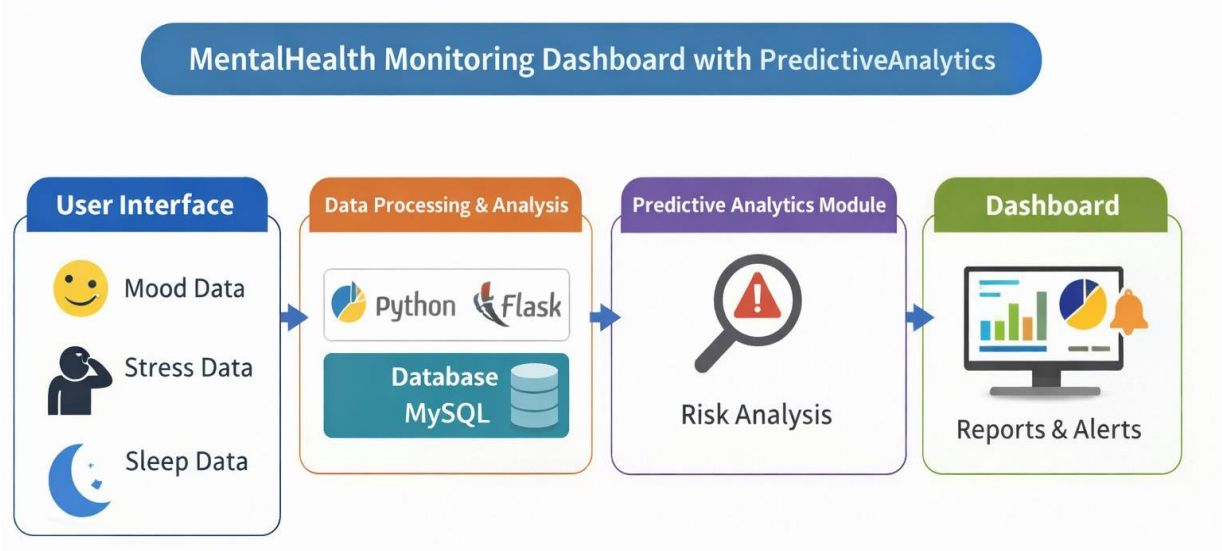

Figure 1 System Design

3.2.Discussion

The results indicate that a technology-driven mental health monitoring system is more effective than traditional manual self-assessment methods. By combining data analysis with dashboard visualization, the system provides clear and meaningful insights to users and helps in identifying behavioral patterns over time. The inclusion of alerts and basic recommendations encourages preventive action, timely self-care, and healthier lifestyle choices. Additionally, secure login and data handling mechanisms ensure user privacy, data confidentiality, and controlled access. The system also supports continuous monitoring, making it useful for tracking mental health trends and promoting long-term emotional well-being. Overall, the system demonstrates the effectiveness of digital tools in supporting mental well-being, early intervention, awareness, and continuous mental health monitoring.

Conclusion

The Mental Health Monitoring Dashboard with Predictive Analytics provides an effective digital solution for continuous mental health assessment and early risk identification. By collecting user inputs such as mood, stress, and sleep patterns, the system analyzes data and presents meaningful insights through an interactive dashboard. The inclusion of predictive analytics, alerts, and secure data handling improves self-awareness, supports preventive care, and encourages timely intervention. Overall, the project demonstrates how web-based technologies can play a significant role in promoting mental well-being and supporting proactive mental health management.

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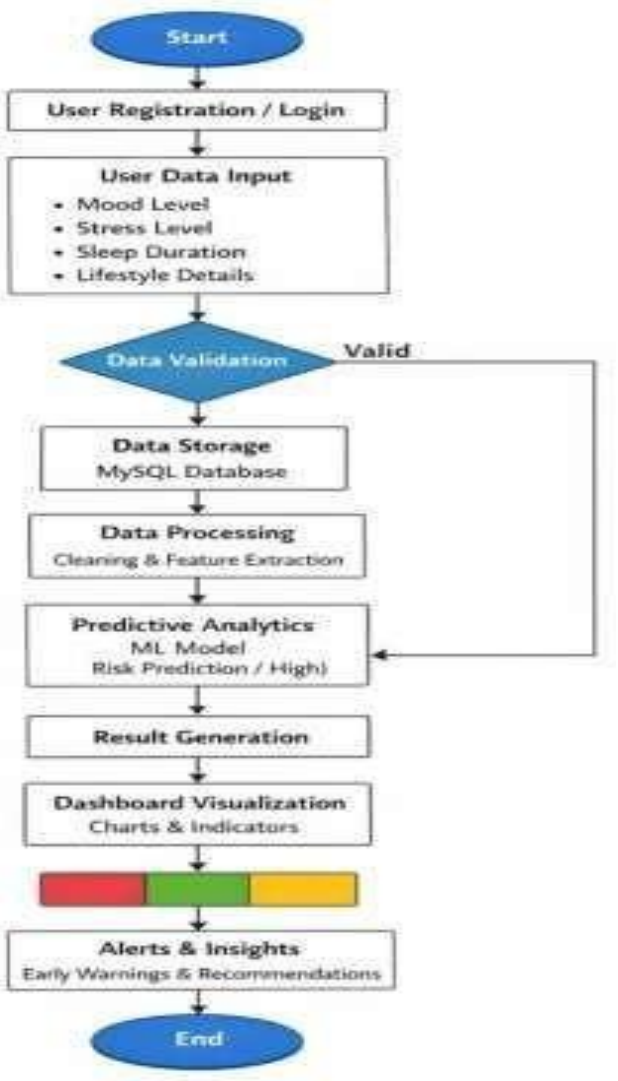

Figure 2 Flow Diagram

References

Previous studies have explored different approaches to web-based mental health monitoring systems. Kumar et al. [1] discussed web-based platforms that enable users to track mental health indicators such as mood, stress, and sleep patterns for early risk identification. Sharma et al. [2] proposed a digital mental health dashboard that uses data analytics to visualize mental well-being and support preventive care through timely alerts. Patel et al. [3] focused on predictive analytics-based systems that classify mental health risk levels using user-provided data, improving self-awareness and early intervention.

Journal Reference Style

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