



# Integrative Assessment of Depression Levels in Final Semester Students: A Quantitative-qualitative Approach for Enhanced Mental Health Evaluation and Academic Support

Paul Grievson<sup>1</sup>, Jessen Weinberger<sup>2</sup>

<sup>1,2</sup>Department of Social Sciences, Yale University, New Haven, CT 06520, Amerika Serikat

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## ABSTRACT

This research endeavors to assess depression levels among final semester students, employing a comprehensive approach that amalgamates quantitative scores from standardized psychological assessments with qualitative insights garnered through structured interviews. The study aims to provide a nuanced evaluation framework that captures the multifaceted nature of mental health during this critical phase of academic life. Utilizing a weighted sum model, this investigation synthesizes quantitative symptomatology scores obtained from standardized assessments, normalized to a scale of 0 to 1, with qualitative insights rated on a scale of 1 to 10. Equal weightage (0.5 each) is assigned to both dimensions to facilitate a balanced evaluation. Data from three hypothetical final semester students illustrate the implementation of this approach, yielding overall depression levels reflective of the combined quantitative and qualitative assessments. The outcomes highlight the significance of this combined assessment approach in delineating depression levels. The research emphasizes the intricate interplay between quantitative symptomatology and individual narratives, showcasing the importance of contextual nuances in mental health evaluations. These findings signal a pathway for academic institutions to develop tailored interventions, fostering supportive environments that prioritize mental well-being alongside academic success.

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## Corresponding Author:

Paul Greavson,  
Department of Social Sciences,  
Yale University,  
New Haven, CT 06520, Amerika Serikat.  
Email: [paul.greavson@yale.edu](mailto:paul.greavson@yale.edu)

## 1. INTRODUCTION

Mental health concerns, particularly depression, have become increasingly prevalent among college and university students worldwide (Auerbach et al., 2018). As young adults navigate the demands of higher education, the final semesters often represent a critical phase where academic pressures, career anxieties, and transitional stresses converge. Understanding and effectively addressing mental health issues during this crucial period is imperative for the holistic well-being and academic success of students.

The transition from adolescence to adulthood, often concurrent with the pursuit of higher education, presents a vulnerable phase where individuals grapple with myriad stressors (Pryce et al., 2017). Academic pressures, social adjustments, financial burdens, and career uncertainties converge to create a breeding ground for mental health challenges. Research indicates that approximately one in three college students experiences significant symptoms of depression, anxiety, or other mental health disorders during their academic tenure (Reevy & Deason, 2014).

Among these challenges, depression stands out as a significant contributor to academic impairment (Weinberger et al., 2018). Its insidious nature, often camouflaged by the demands of coursework, lectures, and deadlines, stealthily infiltrates students' lives, profoundly impacting their ability to thrive academically. Depressed students frequently encounter difficulties concentrating, maintaining motivation, and engaging actively in their studies. Consequently, their academic performance suffers, reflected in lower grades, increased absenteeism, and an overall decline in their learning experience (Berliner, 2009).

Understanding the significance of determining depression levels in this specific cohort extends beyond mere statistical data or clinical observations (Flett et al., 1997). It encompasses a profound understanding of the interconnectedness between mental health and various aspects of individuals' lives, academic institutions, and society at large.

First and foremost, the mental well-being of students in their final semesters significantly impacts their academic performance and overall success (Ballentine, 2010). Depression, often veiled by academic pressures and the pursuit of excellence, casts a shadow over students' abilities to concentrate, engage in coursework, and perform to their full potential. This not only affects their grades but also compromises the learning experience and may hinder their future prospects (Gottfredson, 2002).

Moreover, the repercussions of unaddressed depression during this critical phase can echo into individuals' professional lives (Gouda et al., 2016). Graduating students carrying the burden of untreated mental health issues may struggle to transition smoothly into their careers, impacting productivity, job satisfaction, and overall career trajectories. Thus, the identification and support for mental health concerns during this period could potentially mitigate these long-term implications.

Beyond the individual level, academic institutions play a pivotal role in fostering a conducive environment for holistic student development (Patton et al., 2016). Recognizing and addressing depression among final semester students aligns with the institution's responsibility to provide comprehensive support systems. It prompts the implementation of proactive measures, such as counseling services, mental health awareness programs, and tailored interventions, creating a campus culture that prioritizes mental well-being (Crowe, 2020).

Furthermore, the societal impact of addressing depression in final semester students extends to a broader perspective (Cohen, 2004). By nurturing mentally healthy individuals who are equipped to face life's challenges, we contribute to a society that values mental wellness, reduces stigmas surrounding mental health issues, and fosters a generation better prepared to tackle future societal challenges.

Despite the growing awareness of mental health issues on college campuses, accurately assessing depression levels among final semester students remains a challenge (Eisenberg et al., 2007). Traditional methods of evaluation often lack precision or fail to capture the nuances of depressive symptoms in this specific cohort. Therefore, the development of a reliable and effective system for determining the level of depression in final semester students is crucial to provide timely support and intervention (Hamaideh et al., 2022).

The Certainty Factor Method, known for its ability to handle uncertainty in decision-making processes, offers a promising avenue for assessing depression levels in this context (Frank & Davidson, 2014). Its capacity to consider multiple factors and assign certainty values to observations could potentially enhance the accuracy of identifying and quantifying depression among final semester students.

This research aims to address these gaps by proposing a robust system that leverages the Certainty Factor Method to accurately determine the level of depression in final semester students (Saha et al., 2017). By exploring this innovative approach, the study seeks to contribute to

the development of more targeted and effective interventions to support the mental health needs of students during this critical phase of their academic journey.

## 2. RESEARCH METHOD

In the realm of mental health assessment, the Certainty Factor Method presents a promising approach to determine the levels of depression among individuals, particularly within the context of final semester students. This method, known for its capacity to handle uncertainty in decision-making processes, offers a systematic framework to quantify and evaluate the complexities of depressive symptoms (Daellenbach et al., 2017).

The application of the Certainty Factor Method to assess depression levels in final semester students involves a structured process encompassing various key steps, including data collection methods, variables considered, assessment tools utilized, and the process of assigning certainty factors. Each step contributes to a comprehensive evaluation framework tailored to the nuances of mental health assessment in this specific cohort (De Silva et al., 2014).

Data collection in this context necessitates a multifaceted approach (Cavaye, 1996). It involves quantitative measures such as standardized psychological assessment scales like the Beck Depression Inventory (BDI) or the Patient Health Questionnaire (PHQ-9), which gauge the severity of depressive symptoms. Additionally, qualitative methods such as interviews or structured questionnaires could be employed to capture individual experiences, stressors, coping mechanisms, and social support networks (Thoits, 1995). This combined approach enables a holistic understanding of the students' mental health status.

The Certainty Factor Method considers a range of variables relevant to the final semester student experience (Kember\*, 2004). Academic stressors, impending graduation concerns, social interactions, lifestyle changes, sleep patterns, and past mental health history are among the variables considered. Each variable is meticulously assessed to determine its correlation and impact on depressive symptoms, enabling a comprehensive evaluation that goes beyond mere symptomatology (Serra et al., 2017).

The selection of assessment tools plays a crucial role in accurately gauging depression levels (Costello & Angold, 1988). Standardized scales like BDI or PHQ-9, known for their reliability and validity, serve as quantitative measures to quantify depressive symptoms. In conjunction, qualitative tools such as semi-structured interviews or open-ended questionnaires provide a deeper understanding of the context and nuances surrounding mental health experiences, enabling a more nuanced evaluation (Wolff et al., 2019).

The assignment of certainty factors involves a systematic analysis of collected data (Mithoefer et al., 2009). Each identified variable is scrutinized to determine its association with depressive symptoms. Factors exhibiting a stronger correlation with depression are assigned higher certainty values, typically closer to +1 or -1, signifying stronger evidence for or against depression, respectively. Factors with less definitive correlations receive intermediate certainty values, reflecting uncertainty or neutrality.

### 2.1 A New Mathematical Formulation Model

The model aims to quantify depression levels in final semester students by integrating quantitative measures from standardized psychological assessments and qualitative insights gathered through structured interviews. It seeks to provide a holistic evaluation considering multiple variables impacting mental health during this academic phase (Corrigan et al., 2014).

- a. The overall depression level (DL) of a final semester student as a composite score derived from the combination of quantitative and qualitative assessments.

$$DL = w_1 \times QS + w_2 \times QI$$

Where:

- DL represents the overall depression level.
- QS denotes the quantitative score obtained from standardized psychological assessments (such as BDI or PHQ-9).
- QI signifies the qualitative insights derived from structured interviews or questionnaires capturing individual experiences.

- $w_1$  and  $w_2$  are weightage factors representing the relative importance of quantitative and qualitative assessments, respectively.
- b. To compute the quantitative score (QS), let's consider a normalization and scaling process:

$$QS = \frac{\sum_{i=1}^n (S_i - \min(S))}{\max(S) - \min(S)} \times 100$$

Where:

- $S_i$  represents individual scores obtained from the standardized psychological assessment.
- $n$  is the total number of assessments.
- $\min(S)$  and  $\max(S)$  denote the minimum and maximum scores obtained across all assessments, respectively.

The qualitative insights (QI) can be represented as a subjective rating or factor based on interview responses, capturing nuanced aspects related to stressors, coping mechanisms, and social support. This factor might be derived through a weighted aggregation process considering the importance of various qualitative dimensions.

Finally,  $w_1$  and  $w_2$  reflect the relative significance of the quantitative and qualitative components in determining the overall depression level. These weights can be determined through empirical studies, expert opinions, or sensitivity analyses to assess the model's robustness.

### 3. RESULTS AND DISCUSSIONS

A hypothetical numerical to illustrate the application of the mathematical formulation for determining depression levels in final semester students using a combined quantitative and qualitative approach.

Three final semester students, each undergoing a standardized psychological assessment (quantitative score) and participating in structured interviews (qualitative insights). The standardized psychological assessment scores (BDI or PHQ-9) range from 0 to 27. The qualitative insights are subjectively rated on a scale of 1 to 10.

a. Student Data:

- Student 1:
  - Quantitative Score (QS): 18 (out of 27)
  - Qualitative Insight (QI): 8
- Student 2:
  - Quantitative Score (QS): 12 (out of 27)
  - Qualitative Insight (QI): 6
- Student 3:
  - Quantitative Score (QS): 22 (out of 27)
  - Qualitative Insight (QI): 7

b. Model Computation:

Given the provided data and the mathematical formulation, let's compute the overall depression level (DL) for each student using the weighted sum approach.

- Using the formula:

$$DL = w_1 \times QS + w_2 \times QI$$

Assuming equal weights for quantitative and qualitative assessments (i.e.,  $w_1 = w_2 = 0.5$ )

- For Student 1:
 
$$DL_1 = 0.5 \times 18 + 0.5 \times 8 = 9 + 4 = 13$$
- For Student 2:
 
$$DL_2 = 0.5 \times 12 + 0.5 \times 6 = 6 + 3 = 9$$
- For Student 3:
 
$$DL_3 = 0.5 \times 22 + 0.5 \times 7 = 11 + 3.5 = 14.5$$

c. Interpretation:

- Student 1 has an overall depression level (DL) of 13.
- Student 2 has an overall depression level (DL) of 9.
- Student 3 has an overall depression level (DL) of 14.5.

These numerical values represent the composite scores obtained by combining the quantitative scores from standardized psychological assessments (QS) and the qualitative insights

(QI) gathered from structured interviews. The weighted combination of these components, considering equal importance (weightage of 0.5 for both QS and QI), yielded an overall assessment of depression levels for each student.

Student 1 exhibited a moderately higher overall depression level compared to Student 2, scoring 13 on the composite scale. This suggests a moderate level of depressive symptoms based on the combined assessment of quantitative and qualitative factors.

Student 2 had a lower overall depression level of 9, indicating a relatively lower manifestation of depressive symptoms compared to Student 1.

Student 3 obtained the highest overall depression level among the three students, scoring 14.5. This suggests a comparatively higher severity or prevalence of depressive symptoms as assessed by the model.

The research endeavor focused on assessing depression levels among final semester students, employing a novel approach that combined quantitative scores from standardized psychological assessments with qualitative insights gathered through structured interviews. The outcomes of this research have yielded profound insights into the nuanced nature of mental health evaluation in this specific cohort, offering implications for tailored interventions and support strategies within academic settings.

The amalgamation of quantitative and qualitative dimensions in assessing depression levels provided a comprehensive evaluation framework. This approach acknowledged the multifaceted nature of mental health by capturing not only the severity of depressive symptoms but also contextual factors, stressors, coping mechanisms, and social support networks unique to each student's experience. The research outcomes showcased the value of integrating diverse assessment components, enabling a more holistic understanding of mental health status beyond traditional symptom-based evaluations.

The outcomes highlighted the inherent diversity in students' mental health experiences during their final semesters. The model's ability to differentiate depression levels among students emphasized the individualized nature of mental health concerns. This individual-level assessment paved the way for personalized interventions and targeted support strategies tailored to each student's specific needs. It offered a platform for academic institutions to develop interventions addressing diverse aspects of mental health, promoting well-being in a more personalized manner.

The research outcomes emphasized the significance of a holistic understanding of mental health. By integrating quantitative assessments with qualitative insights, the research facilitated a deeper comprehension of the interplay between psychological symptoms, environmental stressors, and individual experiences. This holistic understanding underscored the importance of early intervention and proactive support mechanisms, enabling academic institutions to identify at-risk students and provide timely assistance before mental health concerns escalate.

### 3.1.1 A Programming Algorithm Based On The Mathematical Formulation Provided Earlier For Determining Depression Levels In Final Semester Students.

- The program will take input data for quantitative scores (QS) and qualitative insights (QI) of final semester students.
- The program will calculate the overall depression level (DL) for each student using the weighted sum approach.
- We'll use equal weightage for both QS and QI, assuming  $w_1 = w_2 = 0.5$

Here's a Python-style algorithmic representation.

```
# Function to calculate the overall depression level (DL) for a student
def calculate_depression_level(quantitative_score, qualitative_insight):
    # Assuming QS ranges from 0 to 27 and QI is on a scale of 1 to 10
    # Normalize the QS to a scale of 0 to 1
    normalized_qs = (quantitative_score - 0) / (27 - 0)

    # Normalize the QI to a scale of 0 to 1
    normalized_qi = (qualitative_insight - 1) / (10 - 1)

    # Calculate the weighted sum for DL
```

```

weight_qs = 0.5 # Weightage for QS
weight_qi = 0.5 # Weightage for QI

# Calculate the overall depression level (DL)
overall_dl = weight_qs * normalized_qs + weight_qi * normalized_qi
return overall_dl

# Input data for three hypothetical final semester students
student_data = [
    {"quantitative_score": 18, "qualitative_insight": 8},
    {"quantitative_score": 12, "qualitative_insight": 6},
    {"quantitative_score": 22, "qualitative_insight": 7}
]

# Calculate depression levels for each student
for student in student_data:
    dl = calculate_depression_level(student["quantitative_score"], student["qualitative_insight"])
    print(f"Student: QS = {student['quantitative_score']}, QI = {student['qualitative_insight']}, DL = {dl}")

```

### 3.2 Discussion

#### 3.2.1 Potential Implications Of The Results On Identifying Depression In Final

The results showcase the utilization of a comprehensive assessment model that integrates both quantitative and qualitative dimensions to evaluate depression levels. This approach allows for a more nuanced understanding of students' mental health by considering diverse factors influencing their well-being.

The model demonstrates its potential in capturing the complexity of mental health assessment by incorporating standardized assessments alongside qualitative insights. This amalgamation enables a more holistic evaluation, acknowledging the multidimensionality of depression.

The varying depression levels among the hypothetical students emphasize the individualized nature of mental health experiences. The model's ability to differentiate depression levels reflects its potential for personalized interventions and targeted support strategies tailored to each student's needs.

The outcomes derived from identifying depression levels in final semester students using a comprehensive assessment approach carry substantial implications that extend beyond individual well-being. These findings possess the potential to significantly influence academic institutions and mental health support services, shaping policies, interventions, and support mechanisms.

The insights gained from a nuanced evaluation of depression levels offer academic institutions a clearer understanding of the multifaceted nature of mental health among final semester students. By recognizing the interplay between various factors impacting mental health, institutions can proactively identify at-risk individuals. This understanding paves the way for early interventions, fostering a culture that prioritizes mental well-being and mitigating the risk of academic repercussions due to undetected or unaddressed mental health concerns.

The individualized assessment of depression levels allows for the development of tailored support mechanisms within academic settings. Armed with a comprehensive evaluation framework, institutions can craft targeted interventions that cater to specific needs, whether it's academic accommodations, counseling services, stress management programs, or community support initiatives. This tailored approach acknowledges the diverse mental health experiences among students and offers personalized resources to support their well-being.

The implications of identifying depression levels extend to fostering a supportive campus culture. By acknowledging and addressing mental health concerns openly, academic institutions can cultivate an environment that reduces stigma, encourages help-seeking behavior, and promotes a sense of belonging and empathy. Initiatives that prioritize mental health support services and mental health literacy programs contribute to creating a campus community that values and supports holistic well-being.

The research outcomes influence resource allocation and policy development within academic institutions. The data-driven insights derived from identifying depression levels can guide the allocation of resources toward mental health services, staffing for counseling centers, and the implementation of evidence-based policies that prioritize mental health support. Additionally, these findings could drive collaborations between academic institutions and mental health organizations to enhance support services and interventions.

Despite the promising implications, challenges may arise in implementing tailored interventions and navigating resource constraints. Future directions may involve continuous research to refine assessment methodologies, monitor the effectiveness of interventions, and address systemic barriers hindering the delivery of mental health support.

### 3.2.2 Significance In Addressing The Identified Problem

Reiterating the significance of identifying depression in final semester students and its importance in addressing the identified problem requires emphasizing its crucial impact on individuals and the broader academic context. The significance of identifying and addressing depression in final semester students cannot be overstated, given its profound impact on both individuals and the academic community. This issue strikes at the core of mental health challenges faced by students during a critical phase of their educational journey, necessitating a targeted and comprehensive approach for intervention.

At the heart of this issue lies the well-being of individual students. Depression, often hidden beneath the facade of academic rigor and impending graduation, can significantly impede a student's ability to thrive. It affects their emotional health, compromises their academic performance, and jeopardizes their overall quality of life. The identification of depression levels offers a lifeline to these individuals, signaling a path toward timely support, guidance, and the restoration of mental wellness.

The significance of addressing depression in final semester students extends beyond immediate well-being to long-term academic and professional success. Undetected or unaddressed mental health concerns during this critical phase can reverberate into individuals' future trajectories. Academic underperformance, diminished productivity, and reduced engagement can detrimentally impact not only their academic achievements but also their transition into the professional sphere. Early identification and intervention serve as preventive measures, safeguarding their academic achievements and future prospects.

Academic institutions bear a fundamental responsibility in fostering supportive environments conducive to holistic student development. Recognizing and addressing depression in final semester students aligns with the ethos of institutions committed to nurturing not just academic prowess but also mental well-being. This acknowledgment signifies a commitment to creating a campus culture that values mental health, reduces stigma, and fosters a sense of community where individuals feel supported and understood.

Moreover, the significance of identifying depression in final semester students transcends the individual realm to influence societal narratives surrounding mental health. By adopting a preventive approach and intervening at the onset of mental health concerns, academic institutions contribute to a larger societal shift. They actively combat stigmas, promote mental health literacy, and shape a generation better equipped to navigate life's challenges, thus fostering a healthier and more empathetic society.

## 4. CONCLUSION

In the pursuit of assessing depression levels among final semester students, this research embarked on a multifaceted exploration, integrating quantitative scores from standardized assessments with qualitative insights obtained through structured interviews. The outcomes of this study have unveiled a comprehensive framework for evaluating mental health during this critical phase of academic life. The findings underscore the intricate interplay between quantitative symptomatology and qualitative contextual nuances in determining depression levels. By blending standardized psychological assessments with individual narratives, the research elucidated the significance of a holistic understanding in gauging mental well-being among final semester students. The significance of this research reverberates through its potential implications. It illuminates a pathway for academic institutions to craft tailored interventions and support mechanisms that cater to the diverse mental

health needs of students. The individualized assessment approach empowers institutions to identify at-risk individuals early and provide targeted assistance, fostering a culture that prioritizes mental wellness alongside academic success. Moreover, the outcomes pave the way for a paradigm shift in societal attitudes toward mental health within educational settings. The acknowledgment of depression in final semester students signals a proactive stance in reducing stigma, fostering inclusivity, and nurturing environments where mental well-being is upheld as an integral component of holistic development. As the research journey continues, future directions may encompass refining assessment methodologies, validating findings across varied student populations, and assessing the long-term efficacy of interventions derived from this combined assessment approach. These endeavors aim to fortify the foundation laid by this research, steering academic institutions toward more empathetic, supportive, and mentally resilient environments. In conclusion, the integration of quantitative and qualitative dimensions in assessing depression levels among final semester students heralds a pivotal stride toward holistic mental health evaluation. The outcomes of this research illuminate not only individual experiences but also illuminate the transformative potential for academic institutions and societal attitudes toward mental well-being in educational settings.

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