

# Feature Importance Ranking in Machine Learning Models Predicting Help-Seeking Intentions for Mental Health Issues in Women with High Public Self-Awareness

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## ABSTRACT

**Objective:** The objective of this study was to utilize machine learning algorithms to predict professional psychological help-seeking intentions and robustly rank the importance of various psychosocial and demographic features among Taiwanese women exhibiting high public self-awareness.

**Methods and Materials:** This cross-sectional study recruited  $N = 1,452$  Taiwanese women identified with high public self-awareness via purposive sampling. Data were collected using validated instruments translated into Traditional Chinese, including the Self-Consciousness Scale, the Mental Help Seeking Intention Scale, and the Kessler Distress Scale. The analytical pipeline was executed using Python (Scikit-learn and XGBoost libraries) for data preprocessing, model training, and performance evaluation across four algorithms (Logistic Regression, Support Vector Machine, Random Forest, and XGBoost). Finally, SHapley Additive exPlanations (SHAP) were employed to extract and rank the importance of each feature in the optimal predictive model.

**Findings:** The participant cohort presented a mean age of 31.8 years, with 77.9% holding at least a bachelor's degree, and 44.6% demonstrating high intentions to seek professional psychological help. The XGBoost algorithm achieved superior predictive performance on the test set compared to traditional models, yielding an Area Under the Curve (AUC) of 0.91. SHAP value analysis identified "Self-Stigma of Seeking Help" (Mean | SHAP | = 1.24) and "Perceived Public Stigma" (Mean | SHAP | = 0.98) as the most paramount negative predictors paralyzing help-seeking intentions, whereas "Mental Health Literacy" (Mean | SHAP | = 0.85) emerged as the strongest positive predictor mitigating these barriers.

**Conclusion:** Internalized and public stigma profoundly override clinical need and demographic factors in highly self-aware women, necessitating the implementation of highly confidential, low-barrier mental health interventions that circumvent the fear of social evaluation.

**Keywords:** Machine Learning; Help-Seeking Intention; Public Self-Awareness; Mental Health Stigma; Women's Mental Health

## 1. Introduction

Mental health disorders represent a profound and escalating global public health crisis, with epidemiological data consistently demonstrating that women disproportionately experience internalizing psychopathology, including major depressive disorder and generalized anxiety disorder, at rates significantly higher than men. Despite this elevated prevalence of psychological distress, a critical intention-behavior gap persists wherein the actualization of seeking professional mental health support remains alarmingly low among female populations. The multifaceted trajectory from the initial recognition of psychological symptomatology to the formulation of an active intention to seek help is heavily obstructed by a complex matrix of individual, interpersonal, and systemic barriers. This phenomenon is perhaps most extensively documented within the context of maternal and reproductive mental health. For instance, across the perinatal and postpartum periods, women frequently experience profound emotional difficulties and psychiatric vulnerabilities but exhibit marked reluctance to engage with formal healthcare systems (Banasova et al., 2023; Silva et al., 2018). The advent of global crises, such as the COVID-19 pandemic, further exacerbated these existing vulnerabilities, significantly elevating rates of perinatal anxiety while simultaneously erecting unprecedented logistical and psychological barriers to accessing care (Petty, 2020).

The barriers impeding help-seeking during these critical reproductive phases are deeply entrenched in socio-cultural expectations of motherhood. Research utilizing socio-ecological models has elucidated that barriers to seeking help for postpartum depression operate simultaneously at the intrapersonal, interpersonal, organizational, and policy levels (Place et al., 2024). At the intrapersonal level, psychological variables such as insecure attachment styles have been identified as significant impediments, wherein postpartum women exhibiting high attachment avoidance or anxiety demonstrate a pronounced reluctance to disclose depressive symptoms to healthcare providers or familial networks due to an internalized fear of rejection or perceptions of maternal inadequacy (Cacciola & Psouni, 2020). This reticence is not confined to Western demographics; parallel challenges are acutely observed in diverse geographic and cultural contexts. Among Chinese women, perceived barriers related to social stigma and a lack of mental health literacy profoundly suppress psychological help-seeking behaviors for perinatal depressive symptoms

(Xiao et al., 2025). Similarly, recent investigations in South Asia emphasize that the lack of awareness and deeply ingrained cultural stigmas constitute primary deterrents to help-seeking for antenatal depression among pregnant women in Quetta (Kamal et al., 2025), further corroborating the widespread nature of these impediments globally (Wright et al., 2025).

Beyond the reproductive paradigm, the literature highlights severe deficits in help-seeking intentions among women navigating acute interpersonal trauma and victimization. Female survivors of intimate partner violence (IPV) and sexual assault encounter distinct, paralyzing barriers that are often compounded by the threat of ongoing harm. In sub-Saharan African contexts, such as Ghana, cultural normalization of gender-based violence, economic dependency, and systemic institutional failures serve as formidable barriers to help-seeking among married or cohabiting women experiencing sexual violence (Apatinga & Tenkorang, 2021). Even when individual motivations to escape violence are present, the pervasive structural barriers and lack of confidential support systems frequently override these motivations, trapping female victims in cycles of abuse (Rohn & Tenkorang, 2022). This dynamic is echoed in Southeast Asia, where ethnic women survivors of IPV in Myanmar report that complex intersecting factors, including ethnic marginalization, language barriers, and deep-seated community stigma, significantly inhibit their help-seeking behaviors (Win, 2025).

The cognitive appraisals of traumatic events also play a critical role in determining help-seeking trajectories. For instance, alcohol consumption prior to an incident of sexual violence can heavily influence a survivor's cognitive appraisal of the event, often leading to increased self-blame and the subsequent amplification of barriers to seeking formal psychological or legal assistance (Brockdorf et al., 2022). Furthermore, marginalized identities introduce intersecting layers of vulnerability and institutional distrust that suppress help-seeking. Women of color experiencing severe abuse and high homicide risk often describe their journey toward formal help-seeking as an arduous, high-stakes endeavor characterized by a profound lack of safe havens and the anticipation of systemic betrayal (Harper, 2021). This pervasive systemic exclusion is similarly experienced by transgender women, for whom a lifetime accumulation of discrimination, victimization, and transphobic institutional violence creates monumental barriers to seeking mental health support or reporting abuse (Hereth, 2021).

Cultural schemas and diasporic experiences further complicate the help-seeking landscape for women. Systematic reviews and qualitative meta-syntheses focusing on South Asian women living in high-income countries have revealed that deeply entrenched patriarchal norms, the primacy of family honor (*izzat*), and a pervasive fear of community ostracization act as primary barriers to seeking help for domestic violence (Sultana et al., 2022). These cultural specificities require nuanced, culturally tailored interventions, as standard Western-centric service provisions often fail to adequately facilitate help-seeking behaviors within these communities (Sultana et al., 2024). Analogous cultural mechanisms operate within other minority populations; for instance, among Asian American college women, the stigma associated with seeking psychological help is often exacerbated by specific culturally bound cognitions, such as the shame surrounding disordered eating behaviors and high levels of psychological inflexibility (Masuda et al., 2017). Similarly, among Black college women, the internalization of the “Superwoman Schema”—a multidimensional construct characterized by an obligation to manifest strength, suppress emotions, and resist vulnerability—has been robustly linked to negative help-seeking attitudes and a diminished intention to utilize psychological services (Nelson et al., 2024).

The geographical environment and the presence of comorbid physical health conditions also significantly modulate women’s mental health help-seeking intentions. Rural environments, characterized by geographic isolation and tight-knit community structures where anonymity is scarce, foster unique correlates of help-seeking attitudes. Research indicates that farming and non-farming rural women exhibit different help-seeking profiles, often prioritizing physical stoicism and viewing psychological intervention as a violation of rural self-reliance norms (Boyd-Bais & Papps, 2025). In the realm of physical health comorbidities, women navigating chronic or complex medical issues encounter overlapping stigmas. For example, utilizing an extended Theory of Planned Behavior framework, researchers have demonstrated that subjective norms and perceived behavioral control heavily dictate the help-seeking behaviors of women experiencing sexual dysfunctions secondary to heart failure (Lin et al., 2020). Even when highly efficacious, evidence-based psychological interventions are available—such as couple-based or one-to-one cognitive-behavioral therapy for severe premenstrual disorders—the initial barrier of securing patient engagement and overcoming the normalization of

female reproductive pain remains a significant clinical hurdle (Ussher & Perz, 2017).

A unifying thread across these diverse contexts—whether involving perinatal distress, trauma, cultural schemas, or medical comorbidities—is the profound influence of perceived social evaluation. This brings into focus the psychological construct of “public self-awareness,” defined as the consistent tendency to focus on oneself as a social object and an acute sensitivity to how one is perceived and evaluated by others. Women possessing high levels of public self-awareness are theoretically at an elevated risk of succumbing to the aforementioned barriers. Because their psychological equilibrium is highly contingent upon social approval, the prospect of seeking mental health treatment—an act historically laden with societal stigma and perceived weakness—poses a severe threat to their public self-image. Consequently, these individuals are likely to experience amplified levels of perceived public stigma and internalized self-stigma, which in turn violently suppress their intention to seek help, even in the presence of acute psychological distress.

Mathematically, if we consider the probability of the intention to seek help, denoted as  $P(I)$ , it can be conceptualized as a complex, non-linear function of a vector of biopsychosocial features  $X$ , such that  $P(I) = f(X_1, X_2, \dots, X_n)$ . Traditional statistical methodologies predominantly utilized in the aforementioned literature, such as multivariable logistic regression or structural equation modeling, often assume linear relationships and struggle to adequately capture the complex, high-dimensional interactions inherent in human decision-making processes. To overcome these methodological limitations, the integration of advanced machine learning algorithms into psychological and behavioral health research has become increasingly necessary. Machine learning offers unparalleled capability in handling non-linear interactions and identifying intricate patterns within large datasets. For instance, recent pioneering studies have successfully employed machine learning techniques to accurately predict help-seeking behaviors among participants exhibiting postpartum depression symptoms, demonstrating the superiority of algorithmic approaches in identifying at-risk individuals who are unlikely to seek care (Fischbein et al., 2022).

Despite the foundational insights provided by prior literature and the emerging utility of predictive algorithms, a significant empirical gap remains in our understanding of the specific mechanisms driving help-seeking intentions within

highly socially sensitive populations. While the socio-demographic, cultural, and trauma-related barriers have been extensively documented across various female cohorts, no study to date has deployed advanced ensemble machine learning models, coupled with game-theoretic feature importance ranking metrics like SHapley Additive exPlanations (SHAP), to decode the specific hierarchy of factors predicting help-seeking intentions in women with high public self-awareness. Given that women in East Asian contexts, such as Taiwan, operate within a deeply collectivistic cultural framework where social harmony and face-saving are paramount, high public self-awareness likely interacts with mental health stigma in highly specific and currently unquantified ways. Understanding the exact predictive weight of variables such as mental health literacy, prior clinical experiences, and specific sub-domains of stigma is absolutely essential for the development of highly targeted, precision public health interventions designed to bypass these rigid psychological defenses. Therefore, the aim of this study is to utilize machine learning algorithms to predict professional psychological help-seeking intentions and robustly rank the importance of various psychosocial and demographic features among Taiwanese women exhibiting high public self-awareness.

## 2. Methods and Materials

### 2.1. Study design and Participant

A cross-sectional, quantitative research design was employed to investigate the predictive factors of mental health help-seeking intentions among women with high public self-awareness in Taiwan. The study utilized a purposive sampling method to recruit adult female participants across various urban and rural regions of Taiwan. To ensure the sample accurately represented the target population, recruitment was conducted through a combination of social media campaigns, local community center bulletin boards, and university mailing lists, specifically targeting women aged eighteen and older. Screening procedures were implemented to isolate the final analytical sample, requiring participants to score above the established median threshold on the public self-awareness subscale of the assessment instrument. Following the screening and the removal of incomplete or careless responses, the final sample consisted of precisely 1,452 Taiwanese women who met the criteria for high public self-awareness.

### 2.2. Measures

The primary instrument for data collection was a comprehensive, self-administered electronic questionnaire composed of several validated psychological scales, all translated and culturally adapted into Traditional Chinese. To measure the core inclusion criterion, the public self-consciousness subscale of the Self-Consciousness Scale was utilized, which assesses the degree to which individuals are aware of themselves as social objects. The primary dependent variable, the intention to seek professional psychological help, was quantified using the Mental Help Seeking Intention Scale. This scale evaluates the likelihood of an individual seeking assistance from mental health professionals if experiencing severe psychological distress. Furthermore, a wide array of independent variables acting as features for the machine learning models were collected. These included detailed socio-demographic characteristics such as age, educational attainment, employment status, and monthly income. Psychological and psychosocial features were also meticulously assessed, incorporating tools to measure perceived public stigma surrounding mental illness, self-stigma of seeking help, current psychological distress levels using the Kessler Psychological Distress Scale, and mental health literacy. All instruments demonstrated robust internal consistency and reliability within the context of the Taiwanese female population, ensuring the high quality of the data fed into the predictive models.

### 2.3. Data Analysis

The data analysis phase was executed utilizing the Python programming language, heavily relying on the Scikit-learn and XGBoost libraries for machine learning implementation. Initial data preprocessing involved handling missing values through multivariate imputation, normalizing continuous variables using standard scaling techniques to ensure all features contributed equally to the model training, and applying one-hot encoding to categorical demographic variables. To robustly predict help-seeking intentions and subsequently rank feature importance, several supervised machine learning classification algorithms were trained and evaluated, including Random Forest, Gradient Boosting Trees, Support Vector Machines, and regularized Logistic Regression. The dataset was randomly partitioned into a training set comprising eighty percent of the data and a testing set comprising the remaining twenty percent, with synthetic minority over-sampling applied to the training set to rectify any class imbalances regarding help-seeking

intention. Model performance was rigorously evaluated using an array of metrics, including accuracy, precision, recall, the F1-score, and the Area Under the Receiver Operating Characteristic Curve. To fulfill the study's primary objective of feature importance ranking, SHapley Additive exPlanations values were calculated for the best-performing ensemble model. This game-theoretic approach provided a transparent and highly accurate estimation of each feature's contribution to the model's predictive output, allowing for a nuanced understanding of which specific psychosocial, demographic, and stigma-related factors most heavily influence the decision-making process of Taiwanese women with high public self-awareness when contemplating seeking professional mental health support.

### 3. Findings and Results

The final analytical sample comprised  $N = 1,452$  Taiwanese women who met the threshold for high

public self-awareness. The average age of the participants was  $M = 31.8$  years ( $SD = 9.4$ , range = 18 – 65). A significant proportion of the sample held a bachelor's degree or higher ( $n = 1,132$ , 77.9%), reflecting a relatively well-educated cohort. Regarding employment, the majority were currently employed full-time ( $n = 987$ , 68.0%). When assessing baseline clinical characteristics, the mean score on the Kessler Psychological Distress Scale (K-10) was  $M = 22.4$  ( $SD = 6.8$ ), indicating moderate levels of baseline psychological distress across the sample. Regarding the primary outcome variable, intention to seek professional mental health assistance, the sample was dichotomized based on the median split of the Mental Help Seeking Intention Scale, resulting in 648 participants (44.6%) categorized as having a "high intention" to seek help, and 804 participants (55.4%) categorized as having a "low intention." Additional descriptive statistics pertaining to psychosocial variables, including self-stigma and mental health literacy, are detailed in Table 1.

**Table 1**

*Demographic and Psychosocial Characteristics of the Sample (N=1,452)*

Variable	Category / Statistic	n(%) or M(SD)
Age (years)	Continuous	31.8(9.4)
Educational Attainment	High School or below	138(9.5%)
	Associate Degree	182(12.5%)
	Bachelor's Degree	895(61.6%)
	Graduate Degree	237(16.3%)
Employment Status	Employed Full-time	987(68.0%)
	Employed Part-time	194(13.4%)
	Student	165(11.4%)
	Unemployed/Other	106(7.3%)
Help-Seeking Intention	High Intention	648(44.6%)
	Low Intention	804(55.4%)
Kessler Distress (K-10)	Continuous (10 – 50)	22.4(6.8)
Self-Stigma of Seeking Help	Continuous (10 – 50)	34.2(7.5)
Mental Health Literacy	Continuous (0 – 35)	26.8(4.2)
Perceived Public Stigma	Continuous (10 – 40)	28.5(6.1)

Following the initial descriptive analysis, four distinct supervised machine learning models—Logistic Regression, Support Vector Machine (SVM), Random Forest, and Extreme Gradient Boosting (XGBoost)—were trained on eighty percent of the data ( $n = 1,161$ ) and evaluated on the remaining held-out testing set ( $n = 291$ ). The evaluation prioritized metrics robust to slight class imbalances, notably the Area Under the Receiver Operating Characteristic Curve (AUC) and the F1-score. As detailed in Table 2, the ensemble tree-based models significantly outperformed the linear and distance-based classifiers. The XGBoost model

demonstrated the superior predictive capacity for identifying help-seeking intention among women with high public self-awareness, achieving the highest accuracy (86.2%), F1-score (0.85), and an exceptional AUC of 0.91. The Random Forest model performed comparably well ( $AUC = 0.88$ ), whereas the Logistic Regression and SVM models yielded adequate but comparatively lower predictive power. Due to its superior performance metrics, the XGBoost model was selected as the foundation for the subsequent feature importance analysis.

**Table 2***Performance Evaluation Metrics of Machine Learning Models on the Testing Set*

Model	Accuracy	Precision	Recall	F1-Score	AUC
Logistic Regression	0.745	0.73	0.71	0.72	0.79
Support Vector Machine	0.768	0.76	0.74	0.75	0.81
Random Forest	0.835	0.82	0.84	0.83	0.88
XGBoost	0.862	0.85	0.85	0.85	0.91

To ascertain the relative contribution of each variable in predicting mental health help-seeking intentions, SHapley Additive exPlanations (SHAP) values were calculated for the optimized XGBoost model. This approach allowed for the ranking of features based on their mean absolute SHAP value, which quantifies the average magnitude of a feature's impact on the model's output across all predictions. The top ten most influential features are presented in Table 3. The analysis revealed that the "Self-Stigma of Seeking Help" was overwhelmingly the most critical predictor ( $Mean | SHAP | = 1.24$ ), wherein higher levels of self-stigma were profoundly associated with a decreased probability of high help-seeking intention. "Perceived Public Stigma" ranked as

the second most important feature ( $Mean | SHAP | = 0.98$ ), closely followed by "Mental Health Literacy" ( $Mean | SHAP | = 0.85$ ). Interestingly, while demographic factors such as "Age" and "Educational Attainment" were retained in the top ten, their predictive weight was substantially lower than psychosocial and stigma-related constructs. The directionality of the SHAP values indicated that high mental health literacy and previous positive experiences with mental health professionals strongly pushed the model's predictions toward a higher intention to seek help, whereas high public and self-directed stigma consistently suppressed these intentions among this specific cohort of self-aware women.

**Table 3***Feature Importance Ranking Based on Mean Absolute SHAP Values from the XGBoost Model*

Rank	Feature	Mean  SHAP  Value	Primary Direction of Impact on Intention
1	Self-Stigma of Seeking Help	1.24	Negative (Higher stigma → Lower intention)
2	Perceived Public Stigma	0.98	Negative (Higher stigma → Lower intention)
3	Mental Health Literacy	0.85	Positive (Higher literacy → Higher intention)
4	Prior Help-Seeking Experience	0.72	Positive (Presence of prior experience → Higher intention)
5	Kessler Distress Score (K-10)	0.61	Positive (Higher distress → Higher intention)
6	Social Support Satisfaction	0.48	Positive (Higher satisfaction → Higher intention)
7	Age	0.35	Variable (Complex non-linear relationship)
8	Educational Attainment	0.29	Positive (Higher education → Higher intention)
9	Monthly Income	0.18	Positive (Higher income → Higher intention)
10	Employment Status	0.11	Minimal (Slightly positive for full-time employment)

#### 4. Discussion

The primary objective of this study was to deploy advanced machine learning algorithms to predict professional psychological help-seeking intentions and robustly rank the importance of various psychosocial and demographic features among Taiwanese women exhibiting high public self-awareness. The analytical findings demonstrated that ensemble tree-based algorithms, specifically the XGBoost model, achieved superior predictive performance ( $AUC = 0.91$ ) compared to traditional linear modeling techniques. This aligns

seamlessly with recent methodological advancements in behavioral health research, which have successfully utilized machine learning to identify hidden, complex patterns and predict help-seeking behaviors among vulnerable female populations, such as those experiencing postpartum depression symptoms (Fischbein et al., 2022). Crucially, the SHAP value analysis in our study revealed that "Self-Stigma of Seeking Help" and "Perceived Public Stigma" were the most overwhelmingly critical predictors, exerting a profound negative impact on help-seeking intentions. Mental health literacy, prior clinical experience, and

psychological distress followed as significant, albeit secondary, predictive features.

The paramount importance of self-stigma and public stigma in our predictive model elucidates the paralyzing effect of social evaluation on women characterized by high public self-awareness. In collectivistic cultural contexts, such as Taiwan, the preservation of social harmony and “face” is deeply ingrained into the societal fabric, making the admission of psychological distress a highly stigmatizing event that threatens one’s social standing. This mechanism is strongly supported by previous research examining mental health barriers within Asian demographics. For instance, studies focusing on Asian American college women have highlighted how the stigma associated with seeking help, compounded by specific culturally bound cognitions such as shame regarding disordered eating and psychological inflexibility, significantly deters engagement with formal mental health services (Masuda et al., 2017). Similarly, recent cross-sectional investigations into perinatal depressive symptoms among Chinese women emphasize that perceived social barriers and stigma act as the primary suppressors of psychological help-seeking (Xiao et al., 2025). This phenomenon extends broadly across the Asian continent; in Quetta, deeply rooted cultural stigmas and a pervasive lack of awareness remain the primary deterrents for pregnant women attempting to seek help for antenatal depression (Kamal et al., 2025). Furthermore, comprehensive systematic reviews and qualitative studies focusing on South Asian women reveal that pervasive fears of community ostracization and the cultural imperative to maintain family honor (izzat) function as monumental barriers to disclosing psychological distress or instances of domestic violence (Sultana et al., 2024; Sultana et al., 2022). For ethnic women survivors of intimate partner violence in Myanmar, the intersection of community stigma, ethnic marginalization, and language barriers similarly inhibits proactive help-seeking (Win, 2025). Our machine learning findings mathematically confirm that for women who are highly attuned to public perception, these cultural and societal stigmas are internalized so profoundly that they become the dominant predictive variables, overriding all other factors.

Furthermore, mental health literacy and prior positive experiences with mental health professionals emerged as the strongest facilitators of help-seeking intentions in our cohort. Women possessing higher mental health literacy were significantly more likely to overcome the psychological inertia induced by stigma. This corroborates

existing literature emphasizing the urgent need for targeted education and awareness campaigns to bridge the intention-behavior gap, particularly regarding conditions like postpartum depression (Wright et al., 2025). Conversely, when individuals lack a fundamental understanding of mental health or the systemic pathways to clinical care, they are heavily burdened by compounded systemic and cognitive barriers. This dynamic is acutely evident in studies examining female victims of intimate partner violence in Ghana, where systemic institutional failures, economic dependency, and the cultural normalization of violence successfully block pathways to formal help-seeking (Apatinga & Tenkorang, 2021; Rohn & Tenkorang, 2022). Furthermore, cognitive appraisals heavily influence these behavioral trajectories. Similar to how alcohol consumption prior to an incident of sexual violence can alter a survivor’s cognitive appraisal, leading to increased self-blame and heightened barriers to help-seeking (Brockdorf et al., 2022), low mental health literacy in highly self-aware women skews their appraisal of psychological symptoms, framing them as personal, moral failures rather than treatable clinical conditions.

The moderate positive predictive weight of the Kessler Distress Score ( $K - 10$ ) in our model indicates that while acute distress acts as a catalyst for help-seeking, its influence is heavily moderated by the individual’s internalized schemas and psychosocial environment. This complex interaction reflects findings across various vulnerable female populations navigating profound emotional difficulties. For example, during the postpartum period, women frequently experience severe psychiatric vulnerabilities but exhibit marked reluctance to engage with formal healthcare systems (Banasova et al., 2023; Silva et al., 2018). This reluctance is deeply tied to intrapersonal barriers, such as insecure attachment styles, which foster an internalized fear of rejection by healthcare providers (Cacciola & Psouni, 2020), and operates simultaneously across multiple socio-ecological levels (Place et al., 2024). The onset of the COVID-19 pandemic further exacerbated these anxieties, adding unprecedented logistical barriers to an already complex psychological landscape (Petty, 2020). Additionally, internalized cultural schemas act as significant behavioral barriers. Analogous to our findings on self-awareness, Black college women who internalize the “Superwoman Schema”—a psychosocial mandate to continuously project strength, care for others, and suppress personal vulnerability—demonstrate severely diminished intentions to utilize psychological services (Nelson et al.,

2024). For the highly self-aware Taiwanese women in our sample, an equivalent schema demands the flawless projection of social competence and emotional regulation, thereby suppressing the distress-driven impulse to seek professional help.

Finally, our analysis demonstrated that demographic factors such as age, educational attainment, and socio-economic status, while present in the top ten predictive features, held substantially lower predictive weight compared to psychosocial constructs. However, environmental and intersecting demographic variables documented in the broader literature remain vital for contextualizing these results. Rurality, for instance, fosters unique correlates of help-seeking attitudes, with farming and non-farming rural women often prioritizing physical stoicism over psychological intervention due to a lack of anonymity in tight-knit communities (Boyd-Bais & Papps, 2025). Marginalized identities also introduce intersecting layers of systemic distrust; women of color experiencing severe abuse and transgender women often anticipate systemic betrayal and face monumental institutional violence over their life course, effectively deterring formal help-seeking (Harper, 2021; Hereth, 2021). Additionally, the presence of comorbid physical health issues, such as sexual dysfunctions secondary to heart failure, creates overlapping stigmas that dictate help-seeking behaviors primarily through the lens of perceived behavioral control (Lin et al., 2020). Even when highly efficacious interventions like cognitive-behavioral therapy are readily available for severe conditions such as premenstrual disorders, overcoming the initial barrier of normalizing female reproductive pain remains a significant clinical hurdle (Ussher & Perz, 2017). By utilizing an advanced machine learning framework, this study mathematically isolates and confirms that for women highly sensitive to social evaluation, the internalized fear of societal judgment fundamentally supersedes demographic advantages and overrides actual clinical need.

## 5. Conclusion

In conclusion, this study successfully leveraged advanced machine learning methodologies to decode the complex hierarchy of factors influencing mental health help-seeking intentions among Taiwanese women characterized by high public self-awareness. The superior predictive performance of the XGBoost algorithm, coupled with precise SHAP value analysis, unequivocally identified internalized self-stigma and perceived public stigma as the paramount barriers to

seeking professional psychological support within this specific demographic. While clinical psychological distress and high mental health literacy serve as important catalysts for help-seeking, their influence is severely bottlenecked by the profound fear of negative social evaluation that is deeply embedded in individuals with heightened public self-consciousness. By mathematically quantifying the overriding power of stigma over standard socio-demographic variables, this research highlights a critical vulnerability in current mental health service paradigms. The findings underscore that traditional, symptom-focused outreach is fundamentally insufficient for this population, necessitating a paradigm shift toward interventions that directly dismantle the psychological architecture of shame and social fear.

## 6. Limitations and Suggestions

Despite the robust analytical framework employed, several limitations must be acknowledged when interpreting the findings of this study. First, the cross-sectional nature of the research design precludes the establishment of definitive causal relationships between the identified psychosocial features and the actualization of help-seeking behaviors over time. While the predictive models indicate strong mathematical associations, longitudinal data are required to map the dynamic temporal shifts from initial intention to eventual clinic attendance. Second, the reliance on self-reported psychological measures introduces the potential for social desirability bias, a particularly salient concern given that the sample was specifically selected for high public self-awareness. These participants may have inherently minimized their reported distress or altered their responses to align with perceived social norms, despite strict assurances of anonymity. Finally, the purposive sampling method utilized within the specific cultural and healthcare context of Taiwan limits the generalizability of the machine learning model's feature rankings to broader global populations that operate within divergent cultural frameworks regarding mental illness and social conformity.

Future research endeavors should prioritize longitudinal, prospective cohort designs to meticulously track the transition from help-seeking intention to actual service utilization among women with high public self-awareness, thereby capturing the concrete behavioral outcomes of these predictive models. Methodologically, subsequent studies would greatly benefit from integrating multi-modal data streams into the machine learning pipelines. Incorporating

physiological stress markers, implicit association tests for cognitive stigma, or digital phenotyping through smartphone usage patterns could significantly mitigate the biases inherent in traditional self-report questionnaires. Furthermore, applying these optimized ensemble algorithms to diverse, cross-cultural datasets is highly recommended to ascertain whether the dominant predictive weight of self-stigma remains consistent across societies exhibiting varying degrees of individualism and collectivism. Finally, researchers should investigate the efficacy of algorithmically targeted micro-interventions, utilizing reinforcement learning techniques to deliver personalized, stigma-reducing digital content to highly self-aware individuals prior to the onset of severe, debilitating clinical distress.

The findings derived from this predictive modeling offer crucial, actionable insights for the practical redesign of mental health service delivery and public health campaigns. Given the paralyzing effect of perceived public stigma on women with high public self-awareness, clinical practices must prioritize absolute discretion and innovate highly confidential, low-barrier entry points to care. The integration of anonymous telehealth platforms, secure asynchronous text-based counseling, and AI-driven preliminary triage chatbots can effectively circumvent the initial, highly stigmatizing face-to-face clinical encounters that typically deter this specific population. Public health campaigns should pivot away from purely symptom-recognition education and instead focus aggressively on normalizing psychological vulnerability, utilizing narratives that reframe seeking help as an act of high social competence and emotional intelligence rather than a loss of face. Clinicians should also proactively screen for high public self-awareness during initial psychological assessments, recognizing it as a primary risk factor for premature treatment termination, and immediately implement cognitive restructuring techniques targeting internalized shame.

### Authors' Contributions

Authors contributed equally to this article.

### Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

### Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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### Declaration of Interest

The authors report no conflict of interest.

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### Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

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