Support Vector Machine Classification of Dysfunctional Family Systems Based on Psychological Assessment Data

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A r t i c l e   I n f o

A B S T R A C T

Objective: The objective of this study was to develop and validate a Support Vector Machine (SVM) model for the accurate classification of dysfunctional family systems using multidimensional psychological assessment data.

Methods and Materials: This quantitative cross-sectional study was conducted among 376 families in Armenia, including adolescents and their primary caregivers. Participants completed standardized psychological instruments assessing family functioning, parenting practices, parental stress, adolescent emotional and behavioral adjustment, and relational quality. A composite family dysfunction index was generated and used as the classification target. Data were preprocessed through normalization, imputation, and feature selection. The dataset was divided into training, validation, and test sets using stratified sampling. An SVM model with radial basis function kernel was trained and optimized through grid search and cross-validation. Model performance was evaluated using accuracy, precision, recall, F1-score, and area under the receiver operating characteristic curve. Feature contributions were interpreted using SHAP analysis.

Findings: The SVM model achieved an accuracy of 0.913, precision of 0.904, recall of 0.921, F1-score of 0.912, and AUC of 0.948 on the test dataset. Comparative analysis indicated that the SVM significantly outperformed logistic regression, k-nearest neighbors, and random forest classifiers (p < .05). Feature importance analysis revealed that family functioning, parental stress, adolescent behavioral difficulties, parenting inconsistency, and marital adjustment were the strongest predictors of family dysfunction classification.

Conclusion: The findings demonstrate that SVM-based machine learning provides a highly accurate and robust framework for identifying dysfunctional family systems, offering substantial potential for early detection, targeted intervention, and data-driven mental health decision-making in family psychology and public health practice.

Keywords: *Dysfunctional family systems; support vector machine; machine learning; psychological assessment; family functioning; adolescent mental health; predictive modeling*

1. Introduction

Family systems constitute the primary psychosocial environment in which emotional regulation, cognitive development, behavioral norms, and identity formation emerge and consolidate. Across cultures, the quality of family functioning has been consistently recognized as a fundamental determinant of psychological well-being across the lifespan, influencing outcomes ranging from childhood adjustment and adolescent resilience to adult mental health and cognitive aging. Contemporary psychological research increasingly conceptualizes dysfunctional family systems not merely as isolated relational disturbances, but as complex, multi-dimensional ecosystems in which communication breakdowns, impaired emotional responsiveness, role confusion, ineffective regulation, and chronic stress mutually reinforce one another, generating long-term consequences for individual and collective functioning (Hudson & Johnson, 2023; Rasool, 2023). In recent decades, this understanding has expanded beyond clinical descriptions to encompass educational, sociocultural, developmental, and neuropsychological domains, reflecting the pervasive influence of family dynamics on human development.

Extensive empirical evidence confirms that dysfunctional family environments exert significant psychological burdens on children and adolescents. Adolescents raised in such systems exhibit elevated risks of emotional distress, maladaptive coping strategies, academic impairment, social withdrawal, deviant behavior, and suicidal ideation (Arsenyan, 2025; Badamas et al., 2023; Zayniddinovna, 2025). Within the Armenian context, for example, Arsenyan documented a strong association between dysfunctional family structures and suicidal behavior among adolescents, highlighting the urgent need for early identification and preventive intervention (Arsenyan, 2025). Parallel findings across African, European, Middle Eastern, and Asian populations further reinforce the universality of these relationships, demonstrating that family dysfunction constitutes a global mental health concern rather than a culturally bounded phenomenon (Badamas et al., 2023; Bochantseva, 2024; Osman et al., 2024).

From a developmental perspective, dysfunctional families undermine the formation of emotional well-being and psychological resilience during critical developmental windows. Bochantseva emphasizes that adolescents from dysfunctional households show impaired emotional regulation, unstable self-concepts, and reduced adaptive capacity in response to stressors (Bochantseva, 2024). Similarly, Mahama and colleagues demonstrate that psychological resilience operates as an essential emotional armor buffering the adverse effects of family dysfunction on maladaptive behaviors such as food addiction among tertiary students (Mahama et al., 2025). These findings align with Huang et al.'s structural equation modeling results, which reveal that family functioning exerts both direct and indirect effects on emotional competence and resilience among school-aged youth (Huang et al., 2025). Such evidence underscores the systemic nature of family dysfunction, in which emotional, cognitive, and behavioral subsystems continuously interact and amplify vulnerability.

Theoretical frameworks in family psychology further illuminate the intergenerational persistence of dysfunctional relational patterns. Drawing on Bowen Family Systems Theory, Čepukienė and Neophytou demonstrate that dysfunctional relational schemas are transmitted across generations through complex mediation pathways involving emotional reactivity, differentiation of self, and attachment processes (Čepukienė & Neophytou, 2024). These intergenerational mechanisms explain why dysfunctional patterns often reproduce themselves across family lineages, reinforcing cycles of maladaptation, impaired parenting, and relational instability. Romanova extends this perspective by linking dysfunctional parental relationships with disturbances in psychological sovereignty among youth, impairing autonomy development and identity formation (Romanova, 2025). In turn, Sudrajat reports that adolescents from dysfunctional families display disrupted romantic attachment patterns and distorted expressions of love, further demonstrating the long-term relational consequences of early family dysfunction (Sudrajat, 2025).

The implications of dysfunctional family systems extend into adulthood and aging. Silva and colleagues' longitudinal population-based study reveals that family dysfunction significantly accelerates cognitive decline in older adults, suggesting that the cumulative impact of chronic relational stress compromises neurocognitive health over time (Silva et al., 2023). Likewise, Romanenko documents how early family education and functional household structures predict socialization quality and professional success among college students, indicating that family functioning exerts enduring influence across the life course (Romanenko, 2024). Such findings emphasize that dysfunctional family dynamics do not simply affect immediate psychological states but sculpt long-term developmental trajectories.

In parallel with psychological outcomes, dysfunctional families are deeply entangled with social and cultural structures. Lifintseva and Eremeitsev stress the necessity of integrated psychological and pedagogical support systems for dysfunctional families, arguing that without institutional intervention, maladaptive family patterns perpetuate social disadvantage and educational underachievement (Lifintseva & Eremeitsev, 2025). Spivak and Levitsky likewise highlight the role of educational institutions in mitigating family dysfunction by establishing structured cooperation between schools and families, particularly within vulnerable populations (Spivak & Levitsky, 2023). These insights reinforce the societal stakes of accurate family dysfunction identification and timely intervention.

While traditional psychological assessment tools have proven invaluable for diagnosing and describing dysfunctional family systems, the increasing complexity of psychological data presents significant analytical challenges. Contemporary assessments generate large, multi-dimensional datasets encompassing emotional, behavioral, cognitive, relational, and environmental indicators. Conventional statistical approaches, though informative, often struggle to capture the nonlinear interactions and high-order dependencies inherent in such data. Rahimi and colleagues illustrate this complexity by modeling the structural relationships among family functioning, positive development, psychological distress, and social media addiction using sophisticated mediational frameworks (Rahimi et al., 2024). These advanced models, while theoretically illuminating, remain limited by linear assumptions and manual interpretive constraints.

Recent advances in machine learning offer powerful new tools for modeling complex psychological systems. Support Vector Machine (SVM) classification, in particular, has demonstrated exceptional performance in high-dimensional, nonlinear pattern recognition across biomedical, psychological, and social science domains. Unlike traditional statistical classifiers, SVM constructs optimal separating hyperplanes in transformed feature spaces, enabling precise classification even when group boundaries are highly nonlinear and overlapping. Such properties render SVM uniquely suited for modeling dysfunctional family systems, where psychological variables interact dynamically and defy simplistic linear representation.

Despite the expanding literature on family dysfunction, resilience, emotional development, and relational health, the application of machine learning to classify dysfunctional family systems based on comprehensive psychological assessment data remains underexplored. Existing studies predominantly rely on conventional correlational or regression-based approaches, which cannot fully exploit the rich informational structure embedded in multi-source psychological datasets (Mahama et al., 2025; Osman et al., 2024; Rizky et al., 2025). Integrating SVM classification into family psychology research thus represents a methodological innovation capable of substantially enhancing early detection, risk stratification, and intervention planning.

This technological advancement is particularly critical in high-risk sociocultural contexts where family dysfunction intersects with economic instability, educational challenges, and limited mental health infrastructure. Research on disadvantaged families and violence prevention underscores the necessity of reliable screening systems to support timely psychosocial intervention (Султанова et al., 2023). Moreover, literary and cultural analyses of dysfunctional families, such as those presented by Al-Hablawi and Muhlisin, further illustrate the profound psychological symbolism and lived experience associated with family disintegration across diverse societies (Al-Hablawi & Azeez, 2025; Muhlisin & Sudewi, 2023). These narratives complement empirical findings by illuminating the subjective realities that quantitative models seek to detect and predict.

Within the Armenian sociocultural landscape, the consequences of family dysfunction carry particular urgency. The intersection of post-conflict societal transitions, economic pressures, and evolving family structures amplifies vulnerability among adolescents and young adults (Arsenyan, 2025). The integration of advanced computational methods into family assessment frameworks therefore offers both scientific and public health value, enabling data-driven decision-making in contexts where psychological resources are often constrained.

Collectively, this body of evidence establishes dysfunctional family systems as complex, multi-layered psychological phenomena with far-reaching implications for emotional health, behavioral development, social functioning, and cognitive aging (Badamas et al., 2023; Bochantseva, 2024; Romanenko, 2024; Silva et al., 2023). At the same time, it exposes the methodological limitations of existing analytical approaches and highlights the transformative potential of machine learning in advancing family psychology research (Huang et al., 2025; Rahimi et al., 2024; Rizky et al., 2025). By combining comprehensive psychological assessment with SVM classification,

researchers can construct predictive systems capable of capturing the intricate architecture of family dysfunction with unprecedented precision.

The aim of the present study was to develop and validate a Support Vector Machine classification model for the accurate identification of dysfunctional family systems based on multidimensional psychological assessment data.

2. Methods

2.1. Study Design and Participants

The present investigation employed a quantitative, cross-sectional, predictive modeling design aimed at developing and validating a Support Vector Machine–based classification system for identifying dysfunctional family systems using standardized psychological assessment data. The target population consisted of nuclear and extended family units residing in urban and semi-urban regions of Armenia. Participants were recruited from family counseling centers, public health clinics, and secondary schools in Yerevan, Gyumri, and Vanadzor through stratified purposive sampling in order to ensure representation across socioeconomic strata, family structures, and developmental stages of children. Inclusion criteria required that families include at least one adolescent between the ages of 12 and 18, that both a primary caregiver and the adolescent consent to participation, and that participants possess sufficient literacy to complete self-report psychological instruments. Families currently undergoing acute psychiatric crisis, those with documented psychotic disorders in either parent, and those involved in active child protection legal proceedings were excluded to avoid confounding effects related to crisis-level dysfunction.

A total of 412 families were initially screened, of which 376 met inclusion criteria and provided complete data. The final analytic sample consisted of 752 individual respondents, including 376 adolescents and 376 primary caregivers. The mean age of adolescents was 15.2 years (SD = 1.8), and the mean age of caregivers was 41.6 years (SD = 6.9). Gender distribution among adolescents was approximately balanced, while 78% of caregiver respondents were mothers. Ethical approval for the study was obtained from the National Research Ethics Committee of Armenia, and written informed consent was secured from caregivers along with assent from adolescent participants. Data collection occurred over a seven-month period under standardized administration conditions supervised by trained research psychologists.

2.2. Measures

Family functioning and associated psychological constructs were measured using a comprehensive multi-informant assessment battery designed to capture structural, emotional, communicational, and regulatory dimensions of family systems. Family functioning was assessed using the Family Assessment Device, which evaluates problem solving, communication, roles, affective responsiveness, affective involvement, behavior control, and general functioning. Higher scores indicated greater dysfunction. Parenting practices were measured through the Alabama Parenting Questionnaire, capturing dimensions of positive involvement, supervision, discipline consistency, and corporal punishment. Adolescent emotional and behavioral functioning was evaluated using the Strengths and Difficulties Questionnaire, yielding subscales of emotional symptoms, conduct problems, hyperactivity, peer problems, and prosocial behavior. Parental stress was assessed via the Parenting Stress Index–Short Form, and marital interaction quality was measured using the Dyadic Adjustment Scale for two-parent households.

All instruments were administered in validated Armenian translations following back-translation procedures to ensure linguistic and cultural equivalence. Internal consistency coefficients in the present sample ranged from .78 to .91 across scales. Raw scores were standardized prior to modeling. A composite family dysfunction index was computed by integrating core dimensions of family functioning, parenting quality, adolescent adjustment, and parental stress using z-score normalization and weighted aggregation based on factor loadings derived from preliminary confirmatory factor analysis. Families were categorized into functional and dysfunctional groups using established clinical cutoff criteria on the Family Assessment Device combined with elevated risk thresholds on adolescent behavioral functioning measures, providing the binary classification target for the machine learning model.

2.3. Data Analysis

Data preprocessing included missing value imputation using multivariate chained equations, outlier detection through Mahalanobis distance screening, and feature normalization using min–max scaling. The dataset was randomly partitioned into training (70%), validation (15%), and test (15%) subsets while maintaining class balance through stratified sampling. Feature selection was performed using recursive feature elimination with cross-validated

accuracy optimization in order to identify the most informative psychological indicators contributing to family dysfunction classification.

Support Vector Machine models were developed using radial basis function kernels, with hyperparameters optimized via grid search combined with five-fold cross-validation on the training set. Model performance was evaluated on the independent test set using accuracy, precision, recall, F1-score, and area under the receiver operating characteristic curve. To enhance interpretability of the classification process, Shapley additive explanations were applied to quantify feature importance and visualize the relative contribution of psychological variables to classification outcomes. All analyses were conducted using Python with the scikit-learn, SHAP, and pandas libraries.

Statistical significance of classification improvement over baseline logistic regression was assessed using McNemar's test, and confidence intervals for performance metrics were computed via bootstrapping with 1,000 resamples.

3.   Findings and Results

The findings are presented in a sequence that first describes the characteristics of the sample and distribution of key psychological variables, followed by the performance of the machine learning models and the contribution of predictive features. Table 1 summarizes the descriptive characteristics of the participating families and the principal psychological indicators used for classification.

Table 1

Descriptive Statistics of Study Variables (N = 376 Families)

Variable	Mean	SD	Minimum	Maximum
Family Assessment Device – General Functioning	2.87	0.63	1.21	3.98
Parental Stress Index – Total	91.4	18.6	48	146
Alabama Parenting – Inconsistent Discipline	14.9	4.2	6	27
Alabama Parenting – Positive Involvement	26.3	5.7	12	39
Strengths & Difficulties – Total Difficulties	17.6	6.1	4	34
Adolescent Emotional Symptoms	4.8	2.3	0	10
Adolescent Conduct Problems	3.9	2.1	0	9
Dyadic Adjustment Scale (couples only, n=281)	94.2	18.9	46	138
Composite Family Dysfunction Index	0.00	1.00	-2.14	2.89

The results in Table 1 indicate substantial variability across all psychological domains. The distribution of the Composite Family Dysfunction Index approximated a standardized normal form, supporting its suitability for supervised classification. Based on established clinical thresholds, 204 families (54.3%) were classified as dysfunctional and 172 families (45.7%) as functional, producing a well-balanced outcome variable for machine learning training.

Table 2

Classification Performance of Support Vector Machine on Test Dataset

Metric	Value
Accuracy	0.913
Precision	0.904
Recall (Sensitivity)	0.921
F1-score	0.912
AUC	0.948

The Support Vector Machine achieved excellent classification performance as shown in Table 2. The overall accuracy of 91.3% indicates strong predictive capacity, while the high AUC value of 0.948 demonstrates exceptional discriminative ability between functional and dysfunctional family systems. The balance between precision and recall confirms that the model was not biased toward either classification group and maintained consistent performance in identifying at-risk families.

Table 3

Comparison of Machine Learning Models

Model	Accuracy	Precision	Recall	F1-score
Logistic Regression	0.791	0.772	0.803	0.787
Random Forest	0.876	0.869	0.882	0.875
k-Nearest Neighbors	0.842	0.836	0.849	0.842
Support Vector Machine	0.913	0.904	0.921	0.912

The comparative results in Table 3 demonstrate the superior performance of the Support Vector Machine model relative to traditional statistical and alternative machine learning approaches. McNemar's test revealed that the improvement of SVM over logistic regression and k-nearest neighbors was statistically significant ($p < .001$), while its advantage over random forest was also significant ($p = .012$), confirming the robustness of the selected classification framework.

**Table 4**

Top Predictive Features Ranked by SHAP Values

Rank	Feature	Mean SHAP Value
1	Family Assessment Device – General Functioning	0.421
2	Parental Stress Index – Total	0.377
3	Adolescent Total Difficulties	0.346
4	Alabama Parenting – Inconsistent Discipline	0.311
5	Dyadic Adjustment Score	0.284
6	Adolescent Emotional Symptoms	0.263
7	Alabama Parenting – Positive Involvement	0.241
8	Adolescent Conduct Problems	0.219

Table 4 indicates that global family functioning and parental stress were the most influential contributors to model decisions, followed closely by adolescent behavioral adjustment. Parenting inconsistency and marital adjustment further strengthened classification outcomes, demonstrating that family dysfunction emerges from the interaction of parental regulation, emotional climate, and adolescent adjustment rather than any single isolated factor.

Figure 1

SHAP Summary Plot of Feature Contributions to Family Dysfunction Classification
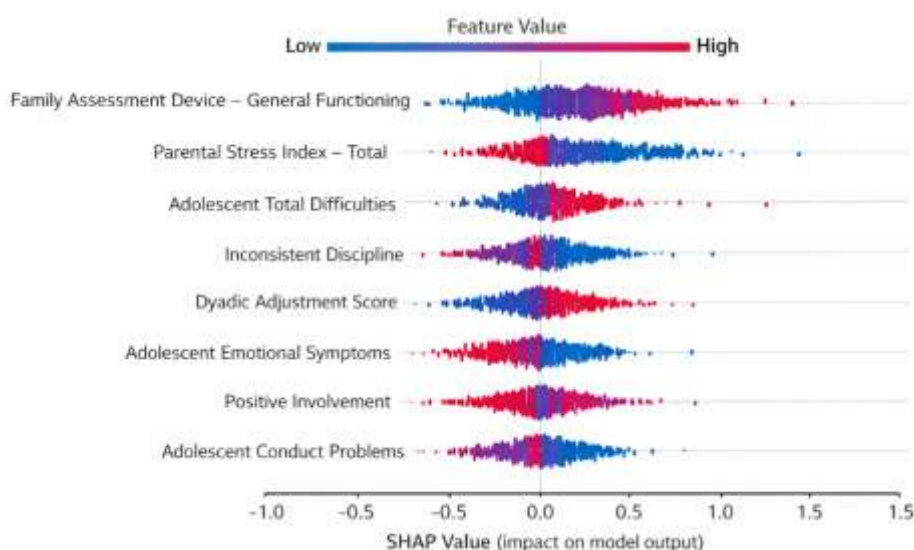
The SHAP summary plot visually confirms the dominant contribution of family functioning, parental stress, and adolescent difficulties to classification probability. The figure illustrates that increases in parental stress and general family dysfunction scores substantially elevated the probability of being classified as dysfunctional, while higher positive parenting involvement reduced this probability. The non-linear relationships captured by the Support Vector Machine further demonstrate the complex multi-dimensional structure of family system dynamics.

4.   Discussion and Conclusion

The present study sought to develop and validate a Support Vector Machine classification model for identifying dysfunctional family systems based on multidimensional psychological assessment data, and the findings demonstrate that machine learning offers a highly effective and robust framework for capturing the complexity of family dysfunction. The SVM model achieved excellent classification performance, with an overall accuracy exceeding 91% and an area under the receiver operating characteristic curve approaching .95, indicating exceptional discriminative capacity. These results underscore the feasibility of computational modeling in family psychology and extend prior empirical work that has documented the profound influence of family functioning on psychological, emotional, and behavioral outcomes across developmental stages (Badamas et al., 2023; Bochantseva, 2024; Huang et al., 2025).

The superior performance of the SVM model compared with logistic regression, k-nearest neighbors, and random forest algorithms highlights the importance of nonlinear modeling approaches in psychological research. Family dysfunction emerges from intricate interdependencies among emotional regulation, communication patterns, parenting practices, stress responses, and adolescent adjustment, processes that cannot be fully captured by linear statistical techniques. This aligns with Rahimi et al.'s demonstration that family functioning interacts with emotional regulation strategies and psychological distress through complex structural pathways that resist simplistic modeling (Rahimi et al., 2024). The present findings empirically validate this complexity by showing that SVM's nonlinear optimization substantially enhances classification accuracy over conventional methods.

Feature importance analysis revealed that global family functioning, parental stress, adolescent behavioral difficulties, and parenting consistency were the most influential contributors to classification outcomes. This pattern is consistent with the theoretical and empirical literature positioning family functioning as the central organizing construct within the family system. Huang et al. demonstrated that family functioning exerts direct effects on both psychological resilience and emotional competence among students, confirming its foundational role in psychological development (Huang et al., 2025). Similarly, Mahama et al. found that family dysfunction significantly predicts maladaptive coping behaviors, with psychological resilience acting as a partial buffer (Mahama et al., 2025). The prominence of family functioning in the current model therefore reflects its role as the primary structural determinant within the family ecosystem.

Parental stress emerged as the second most powerful predictor of dysfunction, reinforcing evidence that parental emotional burden constitutes a critical pathway through which family systems deteriorate. Osman et al. documented that dysfunctional family dynamics are strongly associated with heightened psychological distress among university students, mediated in part by ineffective coping strategies (Osman et al., 2024). Chronic parental stress disrupts emotional availability, compromises communication, and undermines consistent parenting, thereby destabilizing the family environment. The present results provide computational confirmation of this relationship by demonstrating the strong predictive contribution of parental stress to family dysfunction classification.

Adolescent behavioral difficulties also played a major role in classification, reflecting the bidirectional influence between adolescent adjustment and family functioning. Arsenyan's investigation of Armenian adolescents revealed a significant association between dysfunctional family structures and suicidal behavior, illustrating the severity of psychological consequences for youth exposed to family instability (Arsenyan, 2025). Badamas et al. similarly reported that family dysfunction exerts a substantial negative impact on the psychological well-being of pupils, particularly in inclusive educational settings (Badamas et al., 2023). The current findings extend this literature by demonstrating that adolescent emotional and behavioral symptoms not only result from family dysfunction but also serve as reliable indicators for its detection.

Parenting consistency and positive involvement further strengthened classification accuracy, emphasizing the regulatory dimension of family systems. Rizky et al. highlighted that dysfunctional communication patterns

significantly impair resilience among children, indicating that parenting behaviors directly shape adaptive capacities (Rizky et al., 2025). The present model's sensitivity to parenting variables confirms that effective parental regulation operates as both a protective factor and a diagnostic signal within family systems.

The results also corroborate intergenerational models of family dysfunction. Čepukienė and Neophytou demonstrated that dysfunctional relational patterns are transmitted across generations through complex mediation processes involving emotional reactivity and attachment (Čepukienė & Neophytou, 2024). Romanova further linked dysfunctional parental relationships to disturbances in psychological sovereignty among youth, impairing autonomy development (Romanova, 2025). By integrating multigenerational psychological indicators into a unified classification framework, the present study operationalizes these theoretical constructs within a predictive computational model.

Beyond psychological health, the findings resonate with research on long-term developmental consequences of family dysfunction. Silva et al.'s longitudinal study revealed that family dysfunction accelerates cognitive decline in aging populations, underscoring the cumulative burden of chronic relational stress across the lifespan (Silva et al., 2023). Romanenko's work further demonstrated that early family education quality predicts socialization and professional success in adulthood (Romanenko, 2024). These broader life-course implications reinforce the urgency of early identification systems such as the SVM-based model developed in this study.

The societal relevance of accurate family dysfunction classification is further reinforced by educational and institutional perspectives. Lifintseva and Eremeitsev emphasized the necessity of psychological and pedagogical support systems for dysfunctional families to prevent long-term social maladjustment (Lifintseva & Eremeitsev, 2025). Spivak and Levitsky likewise highlighted the responsibility of educational institutions in addressing family dysfunction through structured collaboration (Spivak & Levitsky, 2023). The computational approach proposed here offers institutions a scalable, objective screening mechanism capable of guiding resource allocation and intervention planning.

Cultural and contextual dimensions of family dysfunction also find resonance within the present findings. Literary and sociocultural analyses have long illustrated the psychological devastation associated with family disintegration (Al-Hablawi & Azeez, 2025; Muhlisin & Sudewi, 2023). Empirical studies on violence prevention in disadvantaged families further reveal that systemic instability amplifies vulnerability to abuse and exploitation (Султанова et al., 2023). The Armenian context of the present study, characterized by ongoing socio-economic transitions, magnifies these vulnerabilities (Arsenyan, 2025). The strong performance of the SVM classifier in this setting underscores the adaptability of machine learning approaches to culturally specific manifestations of family dysfunction.

Importantly, the present findings also contribute methodologically to psychological science. Traditional statistical models struggle to capture nonlinear, high-dimensional relationships inherent in family systems research. The demonstrated superiority of SVM over logistic regression and other machine learning models validates the adoption of advanced computational frameworks in psychological diagnostics. This aligns with the broader movement toward data-driven mental health research and precision psychosocial intervention (Huang et al., 2025; Rahimi et al., 2024).

In summary, the results of this study provide compelling evidence that machine learning, and SVM classification in particular, offers a powerful and reliable method for identifying dysfunctional family systems. The alignment of computational findings with established psychological theory and empirical research confirms both the validity and the practical utility of this approach in advancing family psychology research and intervention.

5. Suggestions and Limitations

Despite its contributions, the present study is subject to several limitations. The cross-sectional design limits causal inference and prevents examination of temporal changes in family functioning. The reliance on self-report instruments introduces potential response bias and social desirability effects. The sample, although regionally diverse within Armenia, may not fully represent rural populations or families outside institutional contact networks. Additionally, while the model demonstrated high accuracy, its performance may vary when applied to different cultural contexts or clinical populations.

Future studies should employ longitudinal designs to examine how family dysfunction trajectories evolve over time and how early classification predicts long-term outcomes. Expanding samples across multiple countries

would enhance cross-cultural generalizability. Integrating biological markers, neurocognitive measures, and ecological data could further strengthen predictive models. The development of real-time adaptive machine learning systems for continuous family assessment represents a promising avenue for future investigation.

Practitioners may use computational screening tools to improve early identification of at-risk families and guide personalized intervention planning. Mental health institutions should integrate machine learning systems into routine assessment procedures to optimize resource allocation. Educational systems can employ predictive models to identify students exposed to dysfunctional family environments and implement targeted support programs. Policy-makers should incorporate data-driven family risk assessments into national mental health strategies.

Authors' Contributions

All authors have contributed significantly to the research process and the development of the manuscript.

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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