

The Relationship Between Family Functioning and Academic Risk Among High School Students: An Analysis from a Bioecological and Systemic Perspective

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ABSTRACT:

Academic risk is a critical indicator of vulnerability to high dropout rates in high school. In this context, family functioning emerges as an important protective factor for adolescents. Thus, the objective of this study was to analyze the relationship between family functioning and academic risk among high school students from a bioecological and systemic theoretical perspective. To this end, a quantitative methodology was employed, using a non-experimental, descriptive-correlational, cross-sectional design. The sample consisted of 423 high school students who were administered the Family APGAR Scale and the Academic Risk Scale (ERA). The results indicated that 67.1% of the students perceive some degree of family dysfunction, while more than half (57.4%) exhibit a low overall risk level. Furthermore, a high and statistically significant negative correlation was found between family functioning and academic risk ($Rho = -.503$, $p = < .001$), with the dimension of school disengagement showing the strongest correlation ($Rho = -.523$, $p = < .001$). Consequently, it was concluded that a functional family microsystem acts as a fundamental protective factor against academic risk and school dropout.

Keywords: Academic risk, school dropout, high school, adolescents, family functioning.

1. INTRODUCTION

Internationally, access to quality education is recognized as an inalienable human right and a fundamental driver of adolescents' holistic development. The United Nations (2026) states that "SDG 4: Quality Education" aims to ensure inclusive and equitable quality education that promotes lifelong learning opportunities for all.

In the Mexican context, the National Development Plan 2025–2030 establishes that education is an indispensable element for enabling the population to achieve higher levels of well-being and prosperity (Gobierno de México, 2025). For adolescents, high school education provides them with the academic and vocational tools necessary to continue on to higher education or enter the workforce.

However, in Mexico, this educational level has the highest school dropout rate. According to data from the Instituto Nacional de Estadística y Geografía (2025), the 2023–2024 school year had a dropout rate of 11.3% at the federal level, highlighting a profound gap between the right to education as stipulated at both the international and national levels and the contextual realities that make it difficult for students to continue their educational journey.

Given this scenario, academic risk constitutes a critical indicator and a significant predictor of future educational and career trajectories because it encompasses various situations students may face, such as falling behind, low academic performance, and school failure (Carpio Ramírez et al., 2018). Therefore, understanding the factors that contribute to these at-risk situations is a priority. Although various studies have been conducted in Mexico to identify the factors associated with falling behind and dropping out among high school students (Secretaría de Educación Pública, 2012), the onset of the COVID-19 pandemic shifted the focus regarding the factors previously identified as related to school dropout and withdrawal (INEGI, 2022).

Against this backdrop, various researchers have turned their attention to analyzing relational variables that serve as important protective

factors against academic failure, such as family functioning. For example, in a study conducted by Reyna Saenz & Arce Trueba (2022), the results indicated that indicators of healthy family functioning, as well as the student's level of life satisfaction, can influence academic performance.

Similarly, in a study by Alamada Duarte & Obaco Soto (2024), the findings indicated that academic performance and family variables are positively correlated due to the significant impact that family support has on students' academic success.

From a systemic perspective (von Bertalanffy, 1986), these findings are highly consistent, since the family is not merely a setting for upbringing but a living system that evolves through different life stages requiring a level of adaptation dictated by the environment, and thus, in each of these stages, depending on how family members interact and the level of adaptation achieved, the student's educational trajectory may be facilitated or hindered (Eguiluz, 2024; Feixas i Viaplana et al., 2016).

Along these same lines, family functioning is understood as the set of interactions within the family system that enable it to cope with various internal crises; thus, characteristics such as flexibility, clear communication, functional hierarchy, cohesion, and respect for boundaries are indicators of a functional family (Reyes Narváez & Oyola Canto, 2022).

From the bioecological theory of human development, we can view these characteristics of a functional family as those that enable proximal processes to lead to the development of competencies (Bronfenbrenner & Evans, 2002), reflected in the acquisition of knowledge, skills, and motivation in different areas of the adolescent's life—which acts as a protective factor against risk conditions.

Conversely, characteristics of a dysfunctional family—such as a lack of communication among its members, conflicts, unclear boundaries, and poor interactions within the family system (Reyes Narváez & Oyola Canto, 2022)—lead to proximal processes with developmental outcomes that

result in dysfunction; an example of this is dropping out of school.

In this regard, drawing on both theoretical perspectives is essential for understanding the relationship between individual behavior and family dynamics, as well as for observing how this system interacts with, influences, and is influenced by the school and broader social environment in which the student operates (Célleri-Catigua & Barcia-Briones, 2021).

Furthermore, the need to study these variables is supported by current scientific research, which provides empirical evidence showing how the degree of family functionality affects students' risk behaviors, mental health, and even their academic performance (Reyes Narváez & Oyola Canto, 2022; Flores Peña et al., 2024; Alamada Duarte & Obaco Soto, 2024).

Therefore, the objective of this study was to analyze the relationship between family functioning and academic risk among high school students from a bioecological and systemic perspective, with the aim of laying the groundwork for the design of interventions that include not only the student but also their family and school context.

2. METHODS

2.1 Study Desing

A quantitative approach was employed, using a non-experimental, cross-sectional, descriptive, and correlational design, since the variables were not deliberately manipulated; its descriptive-correlational nature allowed for the description of frequencies and percentages of risk levels and family functioning, as well as for understanding their relationship at a single point in time (Hernández Sampieri & Mendoza Torres, 2018).

2.2 Participants and Sampling

Sampling was non-probabilistic and based on convenience, and included 423 students from the "Julián Gascón Mercado" High School No. 1, part of the Autonomous University of Nayarit, of whom 158 (37.4%) were men and 265 (62.6%) were women; of these, 133 (31.4%) students were

in their first semester, 123 (29.1%) in their third semester, and 167 (39.5%) in their fifth semester—that is, their first, second, and third years, respectively.

2.3 Instruments

Data were collected using the following standardized and validated instruments:

- **Family APGAR** (Smilkstein, 1978): Developed by Smilkstein (1978) and validated by Díaz-Cárdenas et al. (2017), this scale measures family functioning through five items and five response levels ranging from 0 = never to 4 = always, yielding the following levels of family functioning: good functioning, mild, moderate, and severe family dysfunction.
- **Academic Risk Scale (ERA)** (Ríos Godínez & González Castillo, 2026): Measures academic risk through 26 items distributed across three dimensions: cognitive difficulties (12 items), school disengagement (9 items), and low academic performance (5 items). Its response scale is a Likert scale ranging from 1 = never to 5 = always, yielding the following levels of academic risk: low, medium and high academic risk.

The instruments were digitized and administered via a Google Forms questionnaire, which included an initial section containing sociodemographic data, where participants were asked about their age, gender, and grade level. Both instruments demonstrated excellent internal consistency in the sample, with a McDonald's Omega of .91 for the Family APGAR and .94 for the ERA.

2.4 Procedure

Data collection took place after obtaining authorization from the institution to conduct the research, as well as informed consent from parents or legal guardians and from the students themselves.

2.5 Data Analysis

Data analysis ($n = 423$) was primarily conducted using the statistical software JASP (version 0.95.4) and IBM SPSS (version 22). First, a

descriptive analysis of frequencies and percentages was performed to examine the participants' sociodemographic data, as well as their levels of family functioning and academic risk. Second, the Kolmogorov-Smirnov test was applied to assess the normality of the data; since a non-normal distribution was evident for both variables ($p = 0.05$), nonparametric statistics were used (Molina Panchi & Molina Panchi, 2025). To determine the correlation between the two variables, Spearman's *Rho* coefficient was applied, while the Kruskal-Wallis H test was used to compare groups based on levels of family functioning (Nahm, 2016).

3. RESULTS

Table 1. Distribution of family functioning levels among students.

Level of family functioning	<i>n</i>	%
Good family functioning	139	32.9%
Mild family dysfunction	100	23.6%
Moderate family dysfunction	101	23.9%
Severe family dysfunction	83	19.6%
Total	423	100%

Note: The classification is based on the proposed family function levels by Díaz-Cárdenas et al. (2017).

Source: Author's own analysis based on data processed in JASP (version 0.95.4).

Table 1 shows the results for the family functionality variable. According to the data, the majority of students (32.9%) perceive good family functionality. However, when grouping the levels of dysfunction, it becomes evident that the remaining 67.1% of students perceive some degree of difficulty in family dynamics. Specifically, 23.9% of students report moderate dysfunction, followed closely by mild dysfunction at 23.6%, while one-fifth of students (19.6%) perceive severe dysfunction. These results

2.6 Ethical Considerations

This research adhered to the ethical considerations established in the Declaration of Helsinki (World Medical Association, 2024) and the Code of Ethics for Mexican Psychologists (Federación Nacional de Colegios, Sociedad y Asociaciones de Psicólogos de México, A. C. [FENAPSIME], 2018), guaranteeing voluntary participation and ensuring at all times the confidentiality of information and the right to withdraw from the study without any reprisal.

suggest a considerable prevalence of family dynamics perceived as dysfunctional within the student population studied.

With regard to the results on academic risk, Table 2 shows the results obtained overall, as well as for each of its dimensions. The classification presented below corresponds to the three levels of academic risk proposed for the instrument, based on the risk traffic light system proposed by Morales Chávez et al. (2023).

Table 2. Distribution of students by overall academic risk level and by dimension.

Dimension	Low (green)	Medium (Amber)	High (Red)
Overall academic risk	243 (57.4%)	170 (40.2%)	10 (2.4%)
D1: Cognitive difficulties	168 (39%)	217 (51.3%)	38 (9.0%)

D2: School disengagement	334 (79.0%)	80 (18.9)	9 (2.1%)
D3: Low academic performance	249 (58.9%)	155 (36.6%)	19 (4.5%)

Note: The data correspond to frequencies and percentages of the distribution of students at each level according to overall academic risk and its three dimensions.

Source: Author's own work based on the analysis performed in JASP.

As can be seen, in terms of overall academic risk, more than half of the students (57.4%) are at low risk, suggesting that they have sufficient adaptive resources to maintain their academic progress. However, a significant 40.2% of students are at a medium risk level, suggesting that a considerable proportion of the student body exhibits latent indicators of vulnerability that, if not addressed through corrective strategies, could escalate to a critical condition. Additionally, 2.4% of students are at a high risk level and require urgent attention.

The dimension of cognitive difficulties presented the most concerning indicators, with just over half of the students (51.3%) at the medium-risk level and 9.0% at the high-risk level—the highest proportion compared to the other dimensions. These results suggest that the main barrier faced by students is not a lack of interest, but rather difficulties in processing, understanding, and retaining academic information.

Regarding the dimension of school disengagement (in contrast to the previous dimension), this dimension showed the healthiest levels of adaptation. 79.0% of students were at a low risk level, indicating that the vast majority maintain a sense of belonging and sufficient motivation to continue their studies, despite any academic difficulties they may face.

Finally, the third dimension associated with low academic performance showed intermediate results: although 58.9% exhibited a low level of risk, 36.6% of students exhibited a moderate level of risk. These results are consistent with those of the first dimension (cognitive difficulties), since such difficulties eventually translate into low grades or a risk of failing, although not necessarily with the intention of dropping out of school.

To conduct the correlational analysis, a normality test was performed on the two variables using the Kolmogorov-Smirnov test because the sample size was >50 ($n = 423$) (Molina Panchi & Molina Panchi, 2025).

Table 3. Kolmogorov-Smirnov Test of Normality.

Variable	Statistic	G1	p^a
Overall Academic Risk	.057	424	.002
Overall family functioning	.124	424	.000

Note. ^a = Lilliefors significance correction.

Source: Author's own calculations based on the analysis performed in SPSS.

According to the results (Table 3), the data distribution for both variables does not follow a normal distribution ($p > 0.05$); therefore, we opted to use nonparametric statistics for the correlational analysis, specifically Spearman's *Rho*

correlation coefficient to determine the correlation between the variables, as well as the Kruskal-Wallis H test for group comparisons (Nahm, 2016).

Table 4. Spearman's correlations between family functioning and overall academic risk and by dimension.

Academic Risk Variable	Coefficient (<i>Rho</i>)	Interpretation
Overall Academic Risk	-.503*	High correlation
School Disengagement	-.523*	High correlation
Cognitive Difficulties	-.415*	Moderate correlation
Low Academic Performance	-.364*	Moderate correlation

Note: The independent variable is family functioning (APGAR). All one-tailed tests for negative correlation.

* $p < .001$ (one-tailed).

Source: Author's own work based on the analysis performed in JASP.

The results of the correlational analysis (Table 4) show that, overall, academic risk exhibits a statistically significant and strong negative correlation between this variable and the total family functioning score ($Rho = -.503$, $p < .001$), indicating that students who perceive higher family functioning tend to exhibit significantly lower levels of academic risk.

Furthermore, when analyzing the relationship between students' perceived family functioning and the specific dimensions of academic risk, significant negative correlations were found in all cases ($p < .001$). In this analysis, the dimension of school disengagement stood out as having the strongest correlation ($Rho = -.523$), suggesting that family dysfunction is strongly associated with students' loss of interest and emotional

disconnection from their educational process. Similarly, moderate correlations were observed with regard to the dimension of cognitive difficulties ($Rho = -.415$) and, to a lesser extent, with low academic performance ($Rho = -.364$), indicating that, while family dynamics impact all areas, their effect is more pronounced on behavioral and motivational aspects than on final academic performance.

Finally, once the negative correlation between the two variables was established, the Kruskal-Wallis H test was used to determine whether the impact of academic risk differs when a student comes from an environment in which they perceive good family functioning compared to one in which they perceive any level of dysfunction.

The results of the Kruskal-Wallis test revealed significant differences between the groups ($H(3) = 106.2$, $p < .001$); therefore, to identify specific differences between pairs of groups, Dunn's *post hoc* test with Bonferroni correction was used to adjust for significance. Table 5 presents a summary of these results.

Table 5. Dunn's Post hoc test Comparisons—Level of Family Functioning

Comparison	z-Statistic
Good Functioning – Mild Dysfunction	-3.142*
Good function – Moderate dysfunction	-7.775**
Good function – Severe dysfunction	-9.020**
Mild dysfunction – Moderate dysfunction	-4.285**
Mild dysfunction – Severe dysfunction	-5.652**
Moderate dysfunction – Severe dysfunction	-1.584

Note: $*p < 0.05$; $**p < 0.001$ with significance adjusted using the Bonferroni correction (p_{Bonf}). Source: Author's own calculations based on the analysis performed in JASP.

The results indicated that students with good family functioning had significantly lower academic risk scores compared to the groups with mild dysfunction ($z = -3.142$; $p_{Bonf} .010$), moderate dysfunction ($z = -7.775$; $p_{Bonf} < .001$), and severe dysfunction ($z = 9.020$; $p_{Bonf} < .001$). These findings indicate that students in the group with good family functioning show clear and significant differences compared to all levels of family dysfunction, especially compared to the group experiencing severe dysfunction.

Likewise, the group of students with mild dysfunction showed a significant difference from the groups with moderate dysfunction ($z = -4.285$; $p < .001$) and severe dysfunction ($z = -5.652$; $p < .001$). These results suggest that as the degree of family dysfunction increases, the differences between the groups become more pronounced, indicating a possible gradation in the characteristics assessed.

However, no significant differences were found between the moderate and severe dysfunction groups ($p_{Bonf} = .679$). These results suggest that the negative impact of family dysfunction on academic risk reaches a critical level at the moderate stage, stabilizing at the severe stage without showing any further significant increase.

4. DISCUSSION

The objective of this study was to analyze the relationship between family functioning and academic risk among high school students from a bioecological and systemic perspective. Overall, the results revealed that family functioning is not merely an isolated parenting context but a central determinant in the development of students' academic trajectories.

The descriptive analysis revealed a concerning prevalence of vulnerability, both in the family and school contexts. On the one hand, it was found that 67.1% of students perceive some degree of family dysfunction (mild, moderate, or severe).

Furthermore, although the majority were classified as having a low overall academic risk level (57.4%), a significant 49.2% were at a moderate risk level. This proportion is particularly high in the area of cognitive difficulties, where more than half of the students reported problems processing or assimilating what they learn.

From a bioecological perspective, this phenomenon is consistent with observations of the temporal macrosystem, as these cognitive difficulties can be interpreted as a consequence of the learning gap accumulated during the COVID-19 pandemic—a macro-temporal event that disrupted the development of proximal competence processes, such as basic reading and logical skills that should have been acquired during their previous school years (Bronfenbrenner & Morris, 2006).

This interpretation aligns with the findings of Verduga Verduga et al. (2024), who, upon analyzing post-pandemic academic lag as a factor inhibiting academic performance, concluded that the academic lag affecting students since the pandemic is a precursor to academic risk and is considered one of the most significant factors contributing to low academic performance.

Meanwhile, the correlational analysis demonstrated that there is a high and statistically significant negative correlation ($Rho = -.503$, $p < .001$) between family functioning and overall academic risk. These findings are consistent with the existing literature (Reyna Saenz & Arce Trueba, 2022; Alamada Duarte & Obaco Soto, 2024) and confirm systemic theories that assert that when the family system provides a supportive environment and fosters positive interaction among its members, it acts as a protective factor against the stressful demands of the school environment (Céleri-Catigua & Barcia-Briones, 2021).

Likewise, one of the most interesting findings was that, although the dimensions of cognitive difficulties and low academic performance showed the highest prevalence in the sample (60.3% medium/high for cognitive difficulties

and 41.1% medium/high for low academic performance), their correlations with family functioning were weaker than those of school disengagement. Based on the integration of the proposed theoretical models, this allows us to conclude that, while family dynamics act as a protective factor in students' learning process, the attention, memory, or processing problems they perceive may have a multifactorial origin (biological, pedagogical, etc.).

In this regard, although the dimension of school disengagement did not reach the highest risk levels (79% remained at a low level), at the correlational level, this dimension showed the strongest relationship with family functioning ($Rho = -0.523$), which reaffirms the empirical evidence indicating that poor-quality intrafamilial relationships, low parental involvement, and parental imposition (a dysfunctional proximal process) significantly increase demotivation, leading to school dropout (Padua Rodríguez, 2019; Pazmiño Cevallos et al., 2021).

Finally, the results of the Kruskal-Wallis test ($H(3) = 106.2, p < .001$) confirmed that family functioning is not an isolated variable but rather a determining factor in academic risk. The significant difference found in the Dunn's *post hoc* test between the "good functioning" groups and the various levels of "dysfunction" suggests that the stability of the family system acts as a necessary prerequisite for student success, especially when comparing groups that perceive good functioning versus those that perceive severe family dysfunction ($z = 9.020; p_{Bonf} < .001$). Furthermore, one of the most important findings of this analysis was that, once the family system loses its balance and enters a state of moderate dysfunction, the system's ability to fulfill its supportive functions weakens just as much as in severe dysfunction, which translates into a significant increase in the student's academic risk.

5. CONCLUSION

The results presented in this study lead to the conclusion that academic risk among high school students cannot be reduced to an individual

cognitive or pedagogical deficit, but rather constitutes a symptom of a complex interaction between the family and school microsystems. This empirical evidence demonstrates that a functional family, beyond fostering the development of its members through defined roles and norms to address problems that may arise within the home (Reyes Narváez & Oyola Canto, 2022), also acts as a fundamental protective factor against academic vulnerability, whereas the loss of this balance directly impacts students' motivation and desire to continue their education.

Specifically, the study shows that it is not necessary for family dysfunction to reach extreme levels to observe negative repercussions on students' academic trajectories; perceiving a moderate level of family dysfunction is sufficient to weaken the system's capacity to provide support and critically increase the academic risk that may arise.

Upon analyzing the dimensions of risk, it is concluded that, although cognitive difficulties represent one of the most prevalent challenges in classrooms—which can be understood as a consequence of the learning gap caused by the pandemic—it is school disengagement that shows the strongest correlation with family functioning.

This confirms that the deterioration of characteristics of functional families—such as good communication, affection, and adaptability in coping with problems—leads to proximal processes of dysfunction (Bronfenbrenner & Evans, 2002), profoundly undermining adolescents' motivation, emotional well-being, sense of belonging, and academic commitment to their education, bringing them closer to dropping out of school.

6. RECOMMENDATIONS

This research provides useful scientific evidence that lays a solid foundation for the design of future interventions that move beyond an individualistic perspective and adopt systemic and ecological approaches that integrate families as a key microsystem interacting with the school

environment. Actively involving families through interventions that promote family cohesion, adaptability, and communication will equip students with the socio-emotional resources necessary to cope not only with academic demands but also with problems that arise within their homes.

It is recommended to expand the sample to include different high school education institutions in order to ensure proportional representation across various states of Mexico, as well as to implement longitudinal research designs that allow us to understand how these two variables interact throughout students' academic development, thereby providing more comprehensive information for the long-term prevention of school dropout.

7. IMPLICATIONS

This study contributes to the current scientific literature by establishing the correlation between family functioning and academic risk among high school students. These findings have implications for public policy in Mexico; specifically, educational policies should explicitly integrate families as key agents in preventing school dropout and disengagement. Likewise,

educational institutions must serve as a protective environment, offering spaces for active listening, emotional support, and group bonding in order to mitigate the impact of family conflicts, foster a sense of institutional belonging, prevent the risk of dropping out, and, consequently, increase students' chances of social mobility, access to college, and an improved quality of life in the future.

8. LIMITATIONS

Despite the valuable contributions of this study, we acknowledge the limitations of this research in analyzing the relationship between the variables using a cross-sectional research design; therefore, future studies should analyze the relationship between these two variables using longitudinal research designs, as well as include moderating variables such as household socioeconomic status, personal characteristics such as sex, gender, or health conditions, and even relationships with peers at school. This will further reinforce the implementation of the PPCT model (person, proximal process, context, and time) proposed in the bioecological theory of human development (Bronfenbrenner & Morris, 2006).

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