

Family climate and academic performance in nursing students of a Higher Technological University Institute of Ecuador

Clima familiar y rendimiento académico en los estudiantes de enfermería de un Instituto Superior Tecnológico Universitario de Ecuador

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ABSTRACT

Family climate (FC) was related to academic performance (AR) of university nursing students. The sample consisted of 172 students of a Higher Technological University Institution of Ecuador. The approach was quantitative, descriptive-correlational-transectional. A survey was used, and a FF-SIL questionnaire of family functionality, proposed by Ortega Veitia et al. (1999), composed of 14 items. The instrument is used to determine the functionality between existing relationships of each of the family members. Academic performance was collected from the students' final grades in their midterm grades, added to their final average. Jamovi 2.5.6 software was used. Frequencies and percentages were calculated by levels. The Test-Spearman test was used for correlation. There was a high percentage of students with moderately functional and functional families (73.2 %). However, 27.7% showed a dysfunctional or severely dysfunctional family climate. The group (69.8 %) obtained an average academic performance of 7.49 points. A significant correlation was obtained between the variable's family climate and academic performance ($p=0.015$, $Rho=0.185$). Spearman's Rho was also applied to see the relationship between family climate and the father's level of education, obtaining a significant but negative correlation ($Rho=-0.166$, $p=0.029$); but no correlation was found for the relationship between family climate and the mother's level of education ($Rho=-0.007$, $p=0.932$). Family climate is related to academic performance, although other intervening factors cannot be omitted. Family climate is affected by the father's level of education.

Keywords: Family climate, academic performance, student motivation, nursing, educational quality.

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RESUMEN

Se relacionó el clima familiar (CF) con el rendimiento académico (RA) de estudiantes universitarios de la carrera de enfermería. La muestra fue de 172 estudiantes de una Institución Superior Tecnológica Universitaria del Ecuador. El enfoque fue cuantitativo, descriptivo-correlacional- transeccional. Se utilizó la encuesta, y un cuestionario FF-SIL de funcionalidad familiar, propuesto por Ortega Veitía et al. (1999), conformado por 14 ítems. El instrumento es usado para conocer la funcionalidad entre relaciones existentes de cada uno de los integrantes de la familia. El rendimiento académico se recogió a partir de las calificaciones finales de los estudiantes en sus parciales, sumados a su promedio final. Se empleó el software Jamovi 2.5.6. Se calcularon frecuencias y porcentajes por niveles. Para la correlación se usó el Test-Spearman. Se evidenció un porcentaje alto de estudiantes con familias moderadamente funcionales y funcionales (73.2 %). Sin embargo, un 27.7 % mostró tener clima familiares disfuncionales o severamente disfuncionales. El grupo (69.8 %) obtuvo un rendimiento académico medio de 7.49 puntos. Se obtuvo una correlación significativa entre las variables clima familiar y rendimiento académico ($p= 0.015$, $Rho= 0.185$). Se aplicó también el Rho de Spearman para ver la relación entre el clima familiar y el grado de instrucción del padre, obteniéndose una correlación significativa pero negativa ($Rho=-0.166$, $p= 0.029$); pero no se encontró correlación para la relación entre clima familiar y el grado de instrucción de la madre ($Rho=-0.007$, $p=0.932$). El clima familiar si está relacionado con el rendimiento académico, aunque no se pueden omitir otros factores intervinientes. El clima familiar es afectado por el nivel de instrucción del padre.

Palabras claves: Clima familiar, rendimiento académico, motivación estudiantil, enfermería, calidad educativa.

INTRODUCTION

The concept of family has historically been based on a model of nuclear family, father, mother and children. However, the definition of the current family responds to a process of constant transformations or changes, starting from the variety of who can integrate or form a family. Therefore, it is complex to define the family under the same concept, as its internal composition, as well as its conformation or models, it is common for its meanings to vary (Gutiérrez et al., 2016).

The main change focuses on the difference between the nuclear family and another that does not have this assignment, while in the first there are families formed by the couple in marriage and their children, in others different types of structure appear such as those constituted by non-marital union, combined families, single-parent, homoparental, couples with adopted children, extended families, among others (Guatrochi et al., 2020). These new family transformations are the result of the constant change of today's society, which adapts and modernizes from all its social strata.

Gutiérrez et al., (2016) understand, in this sense, that a more accurate meaning of what is experienced today of the term family "is where individuals create, recreate, learn and transmit symbols, traditions, values and forms of behavior" (p. 222). On the other hand, but based on the same concept of family, there is what is experienced within them, the family climate (FC), defined as the perceived environment and the interpretation of it, made by the members of a family. This CF is also recognized as an element of significance in the well-being and physical, emotional and behavioral development of each of the members of the household (Sequera & Yohan, 2020).

A good family climate allows the individual to have a better intrapersonal and interpersonal relationship. These elements mentioned above have a direct impact on decision-making. The right CF makes it easier for people to cope with difficult situations (Pi Osoria & Mena, 2016). The family is considered a component of great importance in the creation of an assertive interaction and meaningful coexistence, from its essence the CF is built. The latter is the means to achieve adequate emotional development, because it adapts the conditions for children to express their needs, ideas and interests, thus becoming the pillar of the biopsychosocial development of the person, contributing to an adequate adaptation and integration into the society of the person (López et al., 2024).

In this sense, Reyes et al., (2019) They pointed out that cohesion among family members contributes to their feeling supported and valued within their family groups. However, this cohesion would have a greater presence in those structured homes where the figure of both parents is shown, and there are rules that govern coexistence and the control of individual actions.

Thus, the family circumstances that determine the life and actions of people can condition certain individual characteristics that will favor or not their personal and educational development. That is why no factor is as significant for academic performance as the family climate, since the family has a great influence on the strengthening of the personality, as well as has effects on student motivation and future academic success (García Núñez del Arco, 2005).

The above idea is complemented by Garbanzo Vargas (2013), when he explains how these personal factors, which in turn influence academic performance, are elements that have been consolidated under the family climate. It is the family that generates the bases for self-concept, motivation, psychological well-being, self-efficacy, among others; which will later translate into the person feeling more capable of performing the different tasks.

At this point, if the family climate is a creator of conditions of well-being in the individual, it should be possible to know the factors that intervene in the student's academic performance. In the knowledge that the educational process is also an eminently social, interpersonal, and complex activity, in which multiple factors converge, both within the educational context and outside it. These factors range from classroom conditions and teaching methodologies to family support and extracurricular activities, interacting in complex ways to influence students' academic performance.

Given this reality, it is essential to analyze academic interactions in a broad way, considering the educational system as a whole. In this way, it is possible to understand more precisely the reasons behind academic achievement, as well as to identify the aspects that need to be improved to optimize the teaching and learning process (Prada Nuñez et al., 2020).

A comprehensive view of the educational development of students, not only in terms of the results achieved, but also in relation to the areas that require strategic interventions to improve academic performance, allows us to arrive at an exhaustive diagnosis of the institutional dynamics used and the factors that participate, such as the educational climate that can determine progress towards the established objectives (González, 2017).

Currently, Higher Education is the object of growing questions about its quality, in this context, universities are expected to respond efficiently to the demands of a changing society. This is accompanied by the need to foster a culture of constant innovation and to implement various reforms that allow institutions to respond effectively to permanent demands (Garbanzo Vargas, 2013). But in order to achieve this articulation between people, their performance and what is sought to achieve educational quality, it is necessary to assess the factors that determine or contribute to the success of the subjects.

Higher Education Institutions (HEIs) have adopted various strategies to optimize academic performance and reduce student dropouts, including the implementation of personalized tutoring programs. These programs allow teachers to offer individualized support to students, facilitating a deeper understanding of the challenges they face in their adaptation to the university environment and in their academic performance. This intervention not only helps students achieve their training goals, but also encourages the development of key skills for their professional life (González, 2017).

Despite this, the reality in HEIs is that university students face various challenges that cause academic stress. Family and social expectations, the demand for task execution, competition among peers and economic situation are other significant factors that affect their performance (López et al., 2024)

Although progress has been made in improving academic performance and student retention, the impact that the family context could have on the individual has received little attention. Taking into account the family environment as a crucial factor in academic development could be a valuable strategy, given that there is evidence that corroborates the existence of a positive correlation between family expectations and students' academic success. Integrating this aspect into academic support programs could significantly strengthen student achievement (Obaya V. & Vargas R., 2014), could benefit the education system.

Academic performance (RA) It is the result of the interaction of multiple conditioning factors that converge significantly in educational achievement, these include sociodemographic, psychosocial, pedagogical, institutional and socioeconomic variables, which cover aspects as diverse as motivation, anxiety, self-esteem, perception of the academic environment, the role of the teacher and the student's sense of purpose (Garbanzo Vargas, 2013).

In turn, academic performance is constituted as the level that a student reaches or can reach in their academic performance, which is measurable and quantifiable. Frequently, evaluation questionnaires, autonomous work, and tests are used for these measurement processes. Its results make it possible to establish a level of knowledge achieved in the students, related to the objectives initially set. To lead the development of good academic performance, a broad analysis of the responsibilities of teachers and parents is necessary. Also know that low academic performance is not only related to individual factors, but rather is a diverse set of social and family factors (Torres Díaz et al., 2020).

In recent years, studies have been carried out on the aforementioned problem, in this context some of the research that has investigated the relationship between the family social climate and the academic performance of students reveal that students who are at a low level of performance have a problematic family climate (Amaya & Ríos, 2021; Oseda Gago et al., 2020; Martínez & Freire, 2020; Velásquez, 2014). Consequently, the family social climate has an impact in some way on a student being more academically efficient. Mendoza & Díaz (2020) have shown that poor academic performance indicates that the student comes from dysfunctional families. The transcendence to more positive scenarios is that in the family climate a strong constitution is generated among its members, providing support and understanding (Choez et al., 2022), which will ultimately allow the promotion of a good family climate and the improvement of the conditions for a more academically efficient performance (Amaya & Ríos, 2021).

Family climate and academic performance are often related (Oseda Gago et al., 2020, Sucari León et al., 2021; Briones Cagua & Meléndez Jara, 2021). This means that as long as there is a better family climate, the student will perform better academically. But also on the contrary, poor academic performance leads to think that the student lives in a conflictive family climate and little or not at all solid in relation to his or her functional structure (Salinas et al., 2021; Álvarez Bermúdez & Barreto Trujillo, 2020; Daquilema Mendoza, 2020).

The fact is that it is not so important if the student belongs to a certain gender, but that their family climate is adequately functional to be able to acquire a certain formal level to perform academically (Salinas et al., 2021). For this reason, a family climate with high levels of violence can affect the student's low performance, regardless of their social context or cultural level (Morillo Cano et al., 2021). The intention is not to minimize the fact that there are, around academic performance, another set of factors such as intelligence, personality, motivation, self-esteem. But also to highlight the need for a good family climate at different educational levels, since it enhances the behaviors and emotions of students (Martínez & Freire, 2020).

In this sense, the strengthening of the family climate can satisfactorily improve the quality of education in HEIs, through the reduction of emotional factors related to a negative family climate, raising students' academic performance. It is worth highlighting what has been pointed out by Pérez Salas et al. (2022) and García et al. (2024) who indicated that the family has a leading role in the student's

education, determining the importance of the family context as a protective agent in development.

The situation that generated this study began when the existence of low academic performance in a group of students of the Nursing career of the institution was identified. This motivated a review of the factors that were influencing what was conceived as a problem for the institution. In a first informal inquiry to the group of students, it was possible to evidence elements of socio-emotional disturbance in some of the students, caused by family problems. For this reason, the study of the Family Climate was taken into consideration.

It is known that family dynamics play a fundamental role in academic performance. However, it was unknown in the institution if the students were being affected by their families in their socio-emotional sphere, and therefore, their performance was impaired. In this sense, the intention was to analyze what could be happening in this family-student-academic performance relationship. This situation would lead this study to draw a correlational objective whose purpose was to know if there was a relationship between Family Climate and Academic Performance in the group of nursing students.

METHODOLOGY

The approach used was quantitative and descriptive-correlational-cross-sectional. The relationship between Family Climate and Academic Performance was sought to be determined. The population was made up of students of the technical career of Nursing enrolled in an HEI in Ecuador. The sample consisted of 172 students.

The methodological strategy consisted of collecting data through the FF-SIL instrument of family functionality, proposed by Ortega Veitia et al., (1999), consisting of 14 items, used to know the functionality between existing relationships of each of the family members in their usual nucleus. The instrument has a Cronbach's alpha of 0.847 (Cordero Pico & Núñez Núñez, 2024). This was organized by levels: Severely dysfunctional (14 – 27); Dysfunctional (28 – 42); moderately functional (43-56) and functional (57-70). Academic performance data were collected from the final grades of the students in their midterms (p1, p2, p3) added to their final average. The evaluation levels used in the institution were considered: Low (0-6), Medium (7-8), High (9-10).

The data analysis was supported by the Jamovi 2.4.14 program. For the correlation test based on Spearman's Rho Test, the existence of a relationship between Family Climate and Academic Performance was proposed if $H_1 = p.: \leq 0.05$. On the other hand, if H_0 resulted in a $p.: >0.05$ there was no significant relationship.

RESULTS

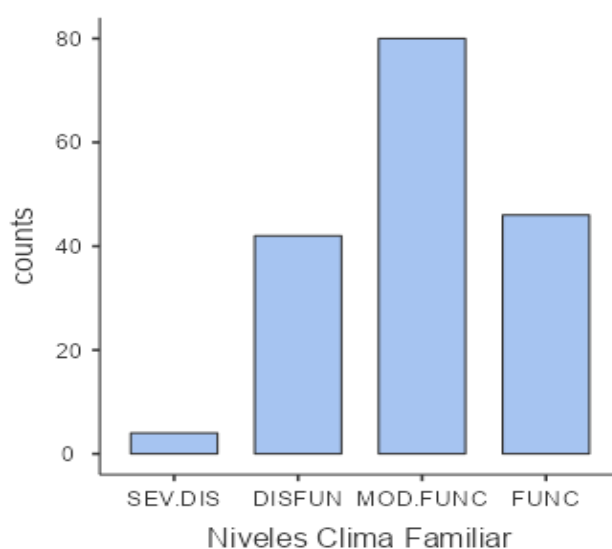
The results (see Table 1 and Figure 1) showed that 46.5% of the students belonged to families with a moderately functional family climate. 26.7% had a functional family climate, and 24.4% had families with dysfunctional family

climates. However, only 2.3% evidenced families with a severely dysfunctional family climate.

Table 1.
Functionality of the Family Climate in Nursing Students

Family Climate Functionality	Frequencies	% of Total
Functional	46	26.7 %
Moderately functional	80	46.5 %
Dysfunctional	42	24.4 %
Severely dysfunctional	4	2.3 %

Figure 1.
Levels of Family Climate.

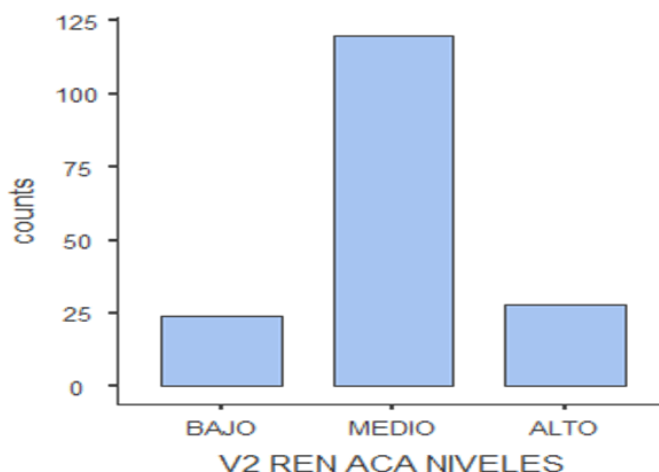


In relation to the academic performance of the students participating in the survey (see Table 2 and Figure 2), 69.8% had a medium academic performance, 16.3% had a high academic performance, and 14% had a low academic performance.

Table 2.
Level of Academic Performance in students

Academic Performance Levels	Frequencies	% of Total
Low	24	14.0 %
Middle	120	69.8 %
High	28	16.3 %

Figure 2.
Level of Academic Performance in students.



The average Academic Performance of Nursing students was 7.49 (± 1.06) points (see table 3), with 9 being the maximum score achieved by students, when the grading system establishes 10 as the maximum score to be achieved.

Table 3.
Score achieved by the group of nursing students

Central Tendency Measure	Student Grading
N	172
Stocking	7.49
Median	8.00
Fashion	8.00
Standard deviation	8.00
Minimal	4.00
Maximum	9.00

The Spearman correlation test performed to relate the two study variables indicated that there is a value of $p = 0.015$, $Rho = 0.185$ (see table 4 and figure 3), for this reason H_0 is rejected, because $p \leq 0.05$, which shows a significant relationship between the Family Climate and the Academic Performance of the students.

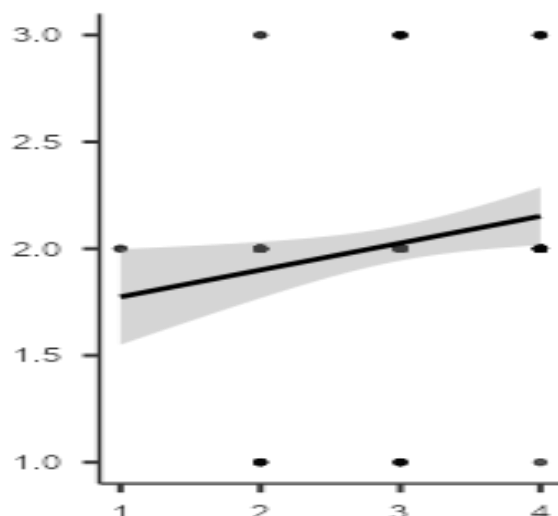
Table 4
Correlation Matrix between the levels of Family Climate and levels of Academic Performance (Spearman's Rho).

Levels of Family Climate	Levels of Academic Performance
	Rho de Spearman 0.185*
P-value: 0.015	

Nota. * $p < .05$, ** $p < .01$, *** $p < .001$

Figure 3.

Correlation matrix between the levels of Family Climate and the Levels of Academic Performance.



One of the results obtained from the data collected for this study referred, when applying Spearman's Rho test, the existence of a negative correlation between the levels of the Family Climate and the father's level of education ($Rho = -0.166$, $p = 0.029$) (see table 5). Although the intention of the research was not to inquire about the particular relationship of the parents and the family climate, it can be observed that this data is striking, because it indicates that the lower the degree of education of the father, Higher Basic and Baccalaureate studies (mean=1.97), the level of the student's family climate will be less functional.

Table 5.

Correlation matrix between the parent's level of education and the student's level of family climate.

Parent's level of education	Levels of the family climate	
	Rho de Spearman	P value
	-0.166*	0.029

Nota. * $p < .05$, ** $p < .01$, *** $p < .001$

However, the same situation was not observed when applying the same analysis to see the relationship between the mother's level of education and the family climate, since a $Rho = -0.007$, $p = 0.932$ was evidenced (see table 6), indicating that although the mothers also presented a mean of 1.85 (Higher Basic and Baccalaureate education degree). There is no significant relationship between the mother's level of education and a functional family climate of the student that could exert a negative relationship on the latter.

Table 6.

Correlation Matrix: the mother's level of education and the level of the family climate.

		Levels of the family climate
Mother's level of education	Rho de Spearman	-0.007
	P value	0.932

Nota. * $p < .05$, ** $p < .01$, *** $p < .001$

DISCUSSION

Family Climate

The results show that most of the students (46.5%) belong to families with a moderately functional family climate, followed by 26.7% with a functional family climate. This is in line with what was stated by Reyes et al. (2019), who point out that cohesion among family members contributes to them feeling supported and valued. The fact that almost three-quarters of the sample have functional or moderately functional family climates suggests that there is a solid basis for the emotional and academic development of these students.

However, it is important to note that 26.7% of students come from families with dysfunctional or severely dysfunctional climates. This could be related to what Gutiérrez et al. (2016) mention about transformations in the family structure and how these can affect the internal climate of the home, being a factor of negative influence on the student's academic performance.

The fact that the data show that most of the group of nursing students have a family climate with a predominance of moderately functional and functional climates (73.2% in total), is encouraging. As López et al. (2021) point out, "the family climate is the means to achieve adequate emotional development, [...] thus becoming the pillar of the biopsychosocial development of the person". However, 26.7% of students with dysfunctional or severely dysfunctional family climates should not be ignored. Guatrochi et al. (2020) mention the diversity of family structures today, which could explain this variability in family climates. It is possible that families are going through processes of adaptation to new dynamics, which could influence the family climate perceived by students.

Academic Performance

A high percentage of the student group (69.8%) has an average academic performance, with an average of 7.49 points. This can be analyzed in the light of what Garbanzo Vargas (2013) has stated, who points out that academic performance is the result of multiple conditioning factors, including sociodemographic, psychosocial, pedagogical, institutional, and socioeconomic variables; that is, it is not necessarily only the family climate that is influencing.

As Prada Núñez et al. (2020) point out, the educational process is "an eminently social, interpersonal, and complex activity, in which multiple factors converge, both within the educational context and outside it" (p.164).

But, in addition, in addition to the above factors, there are those mentioned by López et al. (2024) in this exchange full of various challenges faced by university students such as "family and social expectations, the demand for task execution, competition among peers and the economic situation", factors that could be influencing this average performance.

Relationship between Family Climate and Academic Performance

The study found a significant relationship between family climate and academic performance ($p = 0.015$, $Rho = 0.185$). This corroborates what García Núñez del Arco (2005) has argued, who highlights that no factor is as significant for academic performance as the family climate, or Amaya & Ríos (2021) who state that "the family social climate has an impact in some way on a student being more academically efficient", facts corroborated by Oseda Gago et al. (2020). Sucari León et al. (2021) and Briones Cagua & Meléndez Jara (2021). The positive correlation, although weak, suggests that a better family climate tends to be associated with better academic performance, which is consistent with the literature presented.

However, the results of the correlation allow us to analyze that, although the family climate is important, it is not the only determining factor. This is in line with what González (2017) states about the need for "a comprehensive vision of the educational development of students, not only in terms of the results achieved, but also in relation to the areas that require strategic interventions".

Additional findings

The negative correlation between the levels of the Family Climate and the level of education of the father ($Rho = -0.166$, $p = 0.029$) is an interesting finding. Although it is not specifically mentioned in the reviewed literature, this could be related to what Gutiérrez et al. (2016) mention about family transformations and how they adapt to social changes. It could be that parents with a lower level of education are facing greater challenges in adapting to the educational needs of their university children.

The lack of significant correlation between the mother's level of education and the family climate is a point that deserves further investigation, especially considering the traditional role of mothers in parenting and educational support. At the time, Pérez Salas et al. (2022) and García et al. (2024) had expressed that the role of "the family as a protective agent in development", consequently, the figure of parents and their role in the family should be influencing in some way the education of their children.

CONCLUSIONS

The results obtained in this study largely support what has been stated in the literature on the importance of family climate in the academic performance of university students. However, the moderate relationship suggests that there are other influential factors, such as those mentioned by Garbanzo Vargas (2013), that should also be considered when addressing academic performance in higher education.

In turn, the results underscore the importance of considering the family climate in the university educational context, especially in demanding careers such as Nursing. As Choez et al. (2022) suggest, "the transcendence to more positive scenarios happens because in the family climate a strong constitution is generated among its members, providing support and understanding", perhaps the strengthening of this type of conditioning factors would provide the necessary foundations for the student to respond more effectively to the challenges of the career.

These findings allow us to consider the importance of a favorable family environment, together with the generation of academic support strategies, as proposed by Obaya & Vargas (2014), which may be useful for the design of interventions that improve both the family climate and the academic performance of nursing students. The negative correlation between the levels of the Family Climate and the level of education of the father is an interesting finding that deserves further investigation. It could be related to what they mention, the possibility that parents with a lower level of education face greater challenges in providing this support in the university context to their children.

The lack of significant correlation between the mother's level of education and the family climate contrasts with that of the father. This could indicate complex family dynamics that require further analysis, possibly in line with what Gutiérrez et al. (2016) describe as "family transformations that are the result of constant change in today's society."

RECOMMENDATIONS

Higher education institutions could benefit from implementing strategies that not only focus on academic performance, but also on strengthening the family climate of their students. This could include family support programs, parenting skills workshops for students who are also parents, and counseling services that address both academic and family challenges.

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