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Environmental Influence on Adolescent Resilience Development in Medellin Colombia*

Theme: Promotion and prevention.

Contribution to the discipline: The results of this research provide valuable information on the environment's influence regarding the development of resilient behaviour in youth. With the knowledge emerging from this study, nurses could identify the resilient capacities and resources that adolescent population uses to adapt to each stage of their maturing process, and consequently helping them maintaining healthy lifestyles which is one of the goals of care programs for youth.

ABSTRACT

Objective: To know the influence of the environment (family functionality, social support and neighbourhood and school environment) on the development of adolescent resilience. **Methods:** Descriptive, correlational design. A total of 184 adolescents from six schools in the Aranjuez district of Medellín participated. Probabilistic, two-stage sampling. Five scales were used to collect data: 1) The child and youth resilience measurement scale; 2) The neighbourhood environment questionnaire; 3) The family cohesion and adaptability assessment scale; 4) The multidimensional scale of perceived social support; and 5) The school environment questionnaire. Data were analysed through SPSS 24v *software*. **Results:** a relationship was found between resilience and neighbourhood environment ($r_s = .324, p = .000$), family functionality ($r_s = .380, p = .000$), social support ($r_s = .456, p = .000$) and school environment ($r_s = .353, p = .000$). In addition,

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resilience was explained in 35.8 % by the neighbourhood environment ($\beta = .20$; $p = .012$), family functionality ($\beta = .13$; $p = .090$), social support ($\beta = .30$; $p = .000$) and school environment ($\beta = .15$; $p = .064$). Conclusion: Adolescent resilient behaviour is influenced by social support, family functioning, and school and neighbourhood environment, all external factors fostering self-regulation, as mentioned by Roy's Nursing model.

KEYWORDS (SOURCE: DECS)

Resilience; psychological; psychological adaptation; social environment; minors; Roy's adaptation model.

*Influencia del ambiente en el desarrollo de la resiliencia en adolescentes de Medellín, Colombia**

RESUMEN

Objetivo: conocer la influencia del ambiente (funcionalidad familiar, apoyo social y ambiente barrial y escolar) en el desarrollo de la resiliencia de los adolescentes. **Métodos:** diseño descriptivo, correlacional. Participaron 184 adolescentes de seis colegios de la comuna Aranjuez de Medellín. Muestreo probabilístico, bietápico. Para recolectar los datos, se aplicaron cinco escalas: 1) la escala child and youth resilience measure; 2) el cuestionario de ambiente barrial; 3) la escala de evaluación de cohesión y adaptabilidad familiar; 4) la escala multi-dimensional de apoyo social percibido; y 5) el cuestionario de ambiente escolar. Los datos se procesaron con el *software* SPSS 24v. **Resultados:** se encontró una relación entre la resiliencia y el ambiente barrial ($r_s = .324, p = .000$), funcionalidad familiar ($r_s = .380, p = .000$), apoyo social ($r_s = .456, p = .000$) y ambiente escolar ($r_s = .353, p = .000$). Además, la resiliencia fue explicada en un 35,8 % por el ambiente barrial ($\beta = .20; p = .012$), la funcionalidad familiar ($\beta = .13; p = .090$), el apoyo social ($\beta = .30; p = .000$) y el ambiente escolar ($\beta = .15; p = .064$). **Conclusión:** la conducta resiliente de los adolescentes es influenciada por el apoyo social, la funcionalidad familiar y el ambiente escolar y barrial, factores externos que favorecen la autorregulación, como lo menciona Roy en su modelo de enfermería.

PALABRAS CLAVE (FUENTE: DECS)

Resiliencia psicológica; adaptación psicológica; ambiente social; menores; modelo de adaptación de Roy.

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Influência do ambiente no desenvolvimento da resiliência em adolescentes de Medellín, Colômbia

RESUMO

Objetivo: avaliar a influência do ambiente (funcionalidade familiar, apoio social e ambiente de bairro e escolar) no desenvolvimento da resiliência dos adolescentes. **Métodos:** desenho descritivo, correlacional. Participaram 184 adolescentes de seis colégios da comunidade Aranjuez, Medellín, Colômbia. Amostragem probabilística, bietápica. Para coletar os dados, foram aplicados cinco instrumentos: 1) a escala child and youth resilience measure; 2) o questionário de ambiente de bairro; 3) a escala de avaliação de coesão e adaptabilidade familiar; 4) a escala multidimensional de apoio social percebido; 5) o questionário de ambiente escolar. Os dados foram processados com o software SPSS 24v. **Resultados:** verificou-se relação entre a resiliência e o ambiente de bairro ($r_s = .324, p = .000$), funcionalidade familiar ($r_s = .380, p = .000$), apoio social ($r_s = .456, p = .000$) e ambiente escolar ($r_s = .353, p = .000$). Além disso, a resiliência foi explicada em 35,8 % pelo contexto de bairro ($\beta = .20; p = .012$), pela funcionalidade familiar ($\beta = .13; p = .090$), pelo apoio social ($\beta = .30; p = .000$) e pelo ambiente escolar ($\beta = .15; p = .064$). **Conclusões:** o comportamento resiliente dos adolescentes é influenciado pelo apoio social, pela funcionalidade familiar e pelo ambiente escolar e de bairro, fatores externos que favorecem a autorregulação, como mencionado por Roy no seu modelo de enfermagem.

PALAVRAS-CHAVE (FONTE: DECS)

Resiliência psicológica; adaptação psicológica; meio ambiente; meio social; menores de idade; modelo de adaptação de Roy.

* Artigo derivado da tese de doutorado "Modelo explicativo del consumo de drogas basado en el Modelo de Adaptación de Roy, en un grupo de adolescentes de Medellín, Colombia.", Universidad de Antioquia.

Introduction

Adolescence is a critical time due to the many changes that occur in individuals before reaching maturity (1). During this stage personality is defined, independence is built, and self-affirmation is strengthened. In addition, important physical, sexual, psychological, and social changes occur (2). Often the adolescents exhibit impulsive behaviours or have a low risk perception, which puts them in a position of vulnerability and therefore exposed to risk behaviours, such as drug use and abuse, early sexual starting, unprotected sex, and high speed driving (3, 4).

Moreover external influences such as friends, peers and close family members take on great importance given the motivational significance they have for adolescents. Proof of this is how easily they follow their friends' or peers' indications even above their parents' ones. The desire to be accepted by a group leads them to engage in risky practices, instead of seeking their spotlight to their personal qualities (5).

During adolescence, the process of decision-making, adapting to physical changes, solving problems and coping with different situations in their social, family and school environments make youth vulnerable to issues that keep them from living a healthy life, such as addictions, depression and eating disorders, consequently falling into conflicts with authorities (1). However, adolescents have the capacity to face such adversity, that is, to be resilient (6).

From a holistic perspective, *resilience* is understood as a dynamic (7) and diachronic process that takes place within an ecological and cultural framework (8). Commonly known as the capacity that human beings have to successfully face the various challenges that life presents to them, resilience in adolescents is the capacity they develop to overcome difficult environmental conditions, getting over them and emerging transformed (9). Thus, having high levels of resilience is associated with higher levels of psychological well-being and mental health, as well as a high capacity to manage stress and make progress despite unfavourable or adverse experiences (10).

In line with this, resilience is considered the positive capacity of adolescents to see opportunities and possibilities where others do not and to find solutions towards facing critical and adverse situations and turn them into opportunities to succeed in life (11). This capacity is linked to the existence of specific youth qualities,

virtues and internal resources that allow them to assume changes and face critical situations in a successful way (12).

Resilience construction also depends on the adolescent's personality development and on every meaningful experience lived. Thus, each situation becomes an opportunity either to manage the different resources of the environment for their own benefit or on the contrary, to spoil their well-being and personal development (11). In the same way Ungar defines resilience as the individual and collective ability to navigate in the direction of one's own psychological, social, cultural and physical resources to achieve well-being and the ability to make those resources available in a way that makes sense in the culture (13).

It is important to emphasize that resilience is not an absolute attribute; neither practiced every minute; nor an attribute one is born with. It is the capacity to reflect on the goals that people wishes to achieve in different areas of life, in order to improve their own economic conditions and their family's ones. It is an interactive process between the person and the environment in a risky situation (11).

Roy mentions that the person has the capacity to think and feel, based on consciousness and meaning, which allows people to adapt effectively or ineffectively to changes in the environment, as well as to influence it (14). In other words, adolescents with high levels of resilience seek the resources necessary to achieve their goals: They take advantage of the services provided by their community or school towards solving their difficulties, getting trained academically and professionally, and finding people of their confidence who could provide them with emotional or financial support (11).

The adolescent who has positive external resources also has the capacity to respond effectively to the environment through effective adaptation. On the other hand, Roy points out that the change of environment stimulates the person to respond in an adaptive way (15). The adolescents, throughout their life, acquire the capacity to have a higher or lower resilience (11). Therefore, the neighbourhood environment, family functioning, social support and school environment can influence the development of resilience (16, 17).

In addition, strengthening these resources in adolescents gives them the capacity to respond effectively to risky situations which are present in the environment (effective adaptation), that is to be resilient. Given the interest of this topic for Nursing

professionals, the objective of this study was to understand the influence of the environment (neighbourhood, family, social and school) on the development of adolescent resilience.

Methodology

A descriptive and correlational design was conducted (18). The target population were 55,091 students from 10 to 18 years old, distributed in 15 public schools at the Aranjuez district in Medellín. The sample size calculation was obtained through the statistical program Epidat v4.1, with a 95 % level of confidence, a maximum permitted error of 3 % and a design effect of 1.5 %. Therefore, the required sample were 184 adolescents.

It was a probabilistic two-stage sampling. In the first phase, the schools were randomized and six of them were selected; in the second phase, the selection of participating students was made (18). A personal data form containing four questions (What is your gender? How old are you? What is your family structure? What is your social status?); the child and youth resilience measure (CYRM-28), which aimed at identifying the person's multidimensional resources, taking into account the individual characteristics, context and relationship with the closest environment (19), composed of 28 questions, with a Likert-type response and an Cronbach's alpha of 0,74; the neighbourhood environment questionnaire (CAB), constructed *ad hoc* by means of an exhaustive search of the existing bibliography, with 10 questions answered through Likert-type responses (ranging from totally disagree to totally agree) and a Cronbach's alpha of 0,69; the Family Adaptability and Cohesion Evaluation Scale (FACES III), which assessed the cohesion and adaptability of family functioning with 20 questions, answered through a Likert-type scale ranging from 1 to 5 (never 1; almost never 2; sometimes 3; almost always 4; and always 5) and Cronbach's alpha of 0.77 (20); the multidimensional scale of perceived social support by Zimet et al. (MSPSS), which assessed adolescents' perception of social support, consisting of 12 questions grouped into three factors (peers' perception of social support [questions 6, 7, 9 and 12], family's perception of social support [questions 3, 4, 8 and 11] and perception of support from either the couple or other significant figures [questions 1, 2, 5 and 10]), a seven-point Likert-type response ranging from 1 to 7 (1 = Strongly disagree; 2 = Strongly disagree; 3 = Rather disagree; 4 = Neither agree nor disagree; 5 = Rather agree; 6 = Quite agree; 7 = Totally agree) and Cronbach's alpha of 0.89 (21); and finally, the school environment questionnaire (SEQ), constructed

ad hoc by means of an exhaustive search of the existing scientific literature published, with 20 questions, answered through Likert-type responses ranging from totally disagree to totally agree and an Cronbach's alpha of 0.76.

The questionnaires that were constructed *ad hoc*, by means of an exhaustive search of the existing bibliography, were submitted to content validity by three experts in the field, utilizing the Delphi technique. Subsequently, construct validity was performed by means of exploratory and confirmatory factorial analysis, with varimax rotation with all the items that made up each questionnaire, in addition to applying Cronbach's classic alpha test.

Data were collected with the permission of the chief-directors of each participating school, with parents' consent, and with an informed consent for the adolescents who were randomly selected to participate as part of the sample in this study. Subsequently, the questionnaires and the sociodemographic data form were used in a setting assigned by the chief-directors of the educational institutions. The place had enough light as well as the necessary equipment to get the questionnaires completed by the sample. Finally, the participation of the adolescents, the room availability and the time employed by the teacher participating in this study were acknowledged by the research team.

For this study, the principles of the National Ministry of Health Resolution 08430 of 1993 from Colombia were followed and the approval from the Research Ethics Committee of the Nursing Faculty at the University of Antioquia was obtained and coded as CEI-FE 2015-06 (22).

Finally, the statistical programme for Social Sciences SPSS version 24 (23) was used in the data analysis. The instruments' averages with a value from 0 to 100 were calculated using the following formula: $((SUM(variable\ 1, variable\ 2, \dots) - minimum\ value) / (maximum\ value - minimum\ value)) \times 100$. From the descriptive analysis, we obtained for the quantitative variables (sex, age, family structure, socioeconomic stratum) absolute frequency and percentage distributions, and for the quantitative variables (resilience, neighbourhood environment, social support, family functionality, school environment) measurements of central tendency and variability. We applied the Spearman correlation coefficient test; the simple linear regression test; resilience (as a dependent variable); and neighbourhood environment, social support, family functionality and school environment (as independent variables).

Results

The sample were 184 adolescents, 50.5 % of them were female, 81 % were in early adolescence, 45.1 % belonged to a nuclear family and 47.3 % belonged to stratum 2 (table 1).

Table 1. Participants Sociodemographic data

Variable		f	%
Sex	Male	91	49.5
	Female	93	50.5
Age	Early adolescence	149	81.0
	Late adolescence	35	19.0
Family structure	Nuclear	83	45.1
	Extended	37	20.1
	Single-parent	52	28.3
	Assembled	1	0.5
	Extended single-parent	11	6.0
Socioeconomic level	1	22	12.0
	2	87	47.3
	3	73	39.7
	4	2	1.1

Note: CDP n = 184.

Source: Own elaboration

Moreover the average resilience index in adolescents was 75.9 (*SD* = 17.2); the neighbourhood environment was 41.4 (*SD* = 13.9); family functionality was 60.4 (*SD* = 16.3); social support was 69.8 (*SD* = 23.2); and the school environment was 65.6 (*SD* = 13.8). Thus, it was found that the participating adolescents had good resilience, good family functionality and good social support, and so their perception of the school environment and the neighbourhood environment was positive (Table 2).

Table 2. External resources of adolescents

Variable	\bar{X}	Me	SD	Maximum Value	Minimum Value
Resilience	75.9	81.3	17.234	13	100
Neighbourhood environment	41.4	42.0	13.907	0	80
Family Functionality	60.4	60.4	16.349	0	100
Social Support	69.8	75.0	23.232	0	100
School environment	65.6	65.6	13.816	29	94

Note: \bar{X} = mean, Me = median, SD = estándar deviation. n = 184.

Source: Own elaboration

A significant positive relationship was found between resilience and neighbourhood environment ($r_s = .324, p = .000$), family functionality ($r_s = .380, p = .000$), social support ($r_s = .456, p = .000$) and school environment ($r_s = .353, p = .000$). Consequently, the greater the positive perception of these factors, the greater the resilient behaviour (Table 3).

Table 3. Spearman correlation coefficient between resilience, neighbourhood environment, family functionality, social support and school environment

Variable	1	2	3	4	5
1. Resilience	1				
2. Neighbourhood environment	.324 (.000)	1			
3. Family Functionality	.380 (.000)	.218 (.003)	1		
4. Social support	.456 (.000)	.307 (.000)	.504 (.000)	1	
5. School environment	.353 (.000)	.275 (.000)	.301 (.000)	.377 (.000)	1

Note: r_s = Spearman's correlation coefficient

Source: own elaboration.

By analysing the multiple linear regression, it was found that resilience was explained by 35.8 % by the neighbourhood environment ($\beta = 0.20$), family functionality ($\beta = 0.13$), social support ($\beta = 0.30$) and school environment ($\beta = 0.15$) (Table 4).

Table 4. Environmental Influence on the adolescent resilience development

	Unstandardized Coefficients		t	P-value
	β	E. E		
(Resilience)	29.471	5.563	5.298	.000
Neighbourhood environment	0.20	0.081	2.531	.012
Family Functionality	0.13	.074	1.704	.090
Social Support	0.30	.054	5.416	.000
School environment	0.15	.083	1.866	.064
Model 1	F(5,179) = 26.508, R ² = 35.8 %, p = .000			

Note: E.E = standard error, t = t student, F = F distribution n = 184

Source: Own elaboration.

Discussion

During youth multiple physiological and psychological changes occur disrupting the adolescents' balance and creating a sense of unsafety and uncertainty (24). Such situation leads them to struggle towards acquiring an identity and independence based on the training learned during childhood, in which family emotional links were created and social support, personal safety and their current environment (neighbourhood and school environment) are shaped (25).

The results evidence that adolescents generally have a safe neighbourhood environment, family functionality, positive social support and school environment, and therefore high levels of resilience. Our outcomes are similar to the ones reported by Rodríguez-Fernández, Ramos-Díaz, Ros, Fernández-Zabala and Revuelta, stating in their study that adolescents have high levels of resilience (mean = 74.8, SD = 9.23) and high levels of social support (mean = 33, SD = 5.07) (17), maybe associated with the support needed along the process from childhood to youth when facing changes in a different academic stage and consequently requiring support from new peers, friends and teachers. In addition, the identification of the adolescent's capacity to take advantage of social and family resources within their integrated systems provides mechanisms for the development of resilience (26).

On the other hand, a positive neighbourhood environment, family functionality, social support and school environment were found to increase resilient behaviour in adolescents. Our data is coincident with the Family Functional Theory by Liebschutz & cols. and Cárdenas (27, 16). These authors showed that adolescents with a functional family ($r = .370$; $p = .001$) have high levels of resilience. It is worth mentioning that adolescents who are highly resilient, although they are consuming energy in their adaptation process to the environment, autonomy and confidence, are also capable for facing adversity. This situation, which is very beneficial for the neighbourhood and school environments, shows that it can be a challenge, as it provokes imbalances in those cognitive processes that move the adolescent towards greater levels of social awareness, reflection on their environment and on themselves and for sure towards the generation of significant learning, as they are in constant interaction with the environment (1).

Regarding social support and school environment, several researchers reported previously statistically significant data such

as: adolescents who receive more social support show a more resilient behaviour; this was demonstrated by Sabouripour et al. ($r = .530$, $p < .001$), as well as Cárdenas ($r = .426$; $p = .001$) (28, 16). The school environment also has a positive influence on resilient behaviour as reported by Morales ($Z = 2.83$; $p = .005$) and Quiceno and Vinaccia ($r = .442$; $p < .001$) in the same year (29, 30). This could be due to the fact that adolescents who feel being supported by friends, parents or significant people -such as teachers- tend to seek for solutions to problems by themselves; moreover, their optimism allows them to successfully overcome adverse situations (1).

Furthermore, it was found that the greater the neighbourhood environment, the greater the family functionality, social support and school environment, the greater the resilient behaviour of adolescents. These data coincided with Quiceno and Vinaccia's contributions, who found that a high levels of social support ($r = .467$; $p < .001$) and a high school environment ($r = .442$; $p < .001$) are consistent with high levels of resilience (29). These results are due to the fact that despite the family, school and neighbourhood environments, as well as the new social interactions and the settings for exploration and insertion offer new possibilities for the adolescent to be enriched, they can contribute make them fall into risk behaviours (1).

On the other hand, when the multiple linear regression analysis was performed, it was found that the neighbourhood environment ($\beta = .20$), family functionality ($\beta = .13$), social support ($\beta = .30$) and school environment ($\beta = .15$) explained resilience in 35.8 %. These results are coincident with those reported by Quiceno and Vinaccia, for whom the school environment performs an effect on resilience ($\beta = .18$; $p < .001$) and explains 42 % of the variance (29).

Regarding social support, Sabouripour and Roslan found that it ($\beta = .204$, $p < .001$) is a significant predictor of resilience and explains 52.5 % of the variance (28). This is because even though the influence of family and friends, among others, is paramount, the resulting social support networks have positive effects on the development of resilience (26).

According to the results described, Morales mentions that the school environment and resilience are manifested in behaviours of commitment to school work: class attendance, punctuality, paying attention in class and to the teacher, achievement of school

tasks, high levels of self-confidence, self-discipline, positive attitude towards work, locus of internal control and positive self-esteem; in other words, behaviours and attitudes that tend to stimulate learning.

It is worth mentioning that adolescents with high academic performance showed adequate qualities and skills in intimate relationships with the family. This is due to the fact that the person usually feels respected, has independence and also has its own moral conception (30). In this sense, the development of meaningful social relationships, as well as the promotion of educational processes as an important part of the adolescent's complete training, the understanding of solidarity and social leadership are crucial values when developing resilience (12).

It is worth mentioning that these results prove that having an auspicious neighbourhood environment, good social support, a good school environment and a functional family has positive effects on resilience development. Our outcomes also demonstrate the proposition of Roy's adaptive model, which mentions that external (social) stimuli serve as inputs to the cognitive subsystem, that is, they constitute a series of factors that promote resilience. At the same time, our results support the assumption raised in Roy's Adaptation Model (RAM), which establishes that having external resources (neighbourhood environment, family functionality, social support and school environment) stimulates the adolescent's self-regulation (15). In line with this, Roy mentions that adaptive human systems are complex and multifaceted, they react to environmental stimuli in which they are developed, through coping mechanisms to adapt to the situations they face. The capacity to adapt to the environmental stimuli can create changes in their environment to achieve their well-being (31).

According to the previous ideas, contact with the environmental stimuli activates the capacity to cope (15). Focal stimuli are also related since adolescents have low family functionality and low social support; these act immediately and directly on the adolescent, generating adverse experiences in childhood, which can lead to the development of negative health behaviours (32). In addition, contextual stimuli include the adolescence itself, the type of family functionality, the community pressure or peer relations, a specific culture, available social support and the educational en-

vironment. These play an important part as they reflect the situation in which adolescents live (33).

Consequently, it is important to study resilience in adolescents. By leading them to use their own capacities and resources to overcome difficulties, it becomes a useful tool to reduce possible risk behaviours in one of the most crucial phases of life. The resilient person not only overcomes the difficulty but comes out stronger and with the possibility of developing a higher level of well-being (1). The adolescent, as a person who can adapt to situations, with capacity for resilience, must be approached from all spheres. This reflects the need to integrate strategies -based on scientific evidence in specific interventions- to promote action, empowerment, and leadership in the group of adolescents, as well as to bring about greater approach between peers and protecting agents (12).

Conclusions

The results show that the neighbourhood environment, social support, family functionality and school environment influence the resilient behaviour of adolescents, as they are external resources fostering self-regulation, as mentioned by Roy's Nursing model.

The results of this research highlight how external resources influence the development of resilience in adolescents, so that they can adapt to the changes in their life stages and avoid risk behaviours. In addition, our outcomes contribute to the generation of knowledge, which could be applied in clinical practice and be helpful for implementing nursing intervention strategies focused on the adolescents' needs.

Finally, it should be emphasized that although the neighbourhood environment, family functionality, social support and school environment were found to influence the development of resilience, these are only some of the factors that could explain this phenomenon as this research study did not take into account other biochemical, psychological and personality variables, which may limit the study.

Conflicts of interest: None declared.

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