

# Evidence-Based Adolescent Healthcare Programs Strengthening Emotional Resilience and Academic Motivation Through Pediatric Preventive Care Services

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## Abstract

Adolescence refers to a significant period of massive physical, emotional, social, and mental changes that make adolescents highly vulnerable to psychosocial stress, emotional swings, and academic difficulties. Pediatric preventive healthcare services have been advancing in recent years as a key setting in which to support the well-being of adolescents beyond the physical condition through the incorporation of counseling, psychosocial screening, health education, and early supportive measures. The current study assessed the quality of the evidence-based and adolescent healthcare programs in enhancing emotional and academic motivation based on the preventive care provision to children. A quasi-experimental pre-post intervention was done in 240 adolescents between the ages of 12-18 years in school based pediatric preventive care clinics and community adolescent based health centers. A structured questionnaire was used to gather data and measure Emotional Resilience Score (ERS) (as the primary outcome), Academic Motivation Index (AMI) (as the secondary outcome) and Preventive Care Participation Score (PCPS) (as the intervention exposure variable). Statistical analyses were performed using: descriptive statistics, paired t-tests, Pearson correlation analysis, and multiple linear regression. The outcomes showed a large increase in ERS between 61.84 +/-10.72 prior to the intervention and 78.46 +/-9.15 following the program ( $p < 0.001$ ). Academic motivation also improved significantly, with AMI increasing from 64.27  $\pm$  11.03 to 80.12  $\pm$  8.67 ( $p < 0.001$ ). ERS demonstrated a significant positive association with AMI and PCPS, whereas a regression analysis revealed preventive care attendance and counseling involvement as important predictors of emotional resilience. The results emphasize the importance of prevention programs in pediatrics to improve emotional health and academic motivation among adolescents.

**Keywords :** Adolescents; emotional resilience; academic motivation; preventive pediatric care; adolescent healthcare programs; psychosocial well-being

## 1. Introduction

Adolescence is a crucial stage of development characterized by rapid physical, emotional, social and cognitive development. Also, at this age an adolescent is likely to undergo psychosocial stress, emotional instability, academic pressure, identity, peer relationship and family expectation problems. These stressors might have adverse impact on emotional well-being, ability to cope and academic activity, unless handled effectively. Emotional resilience, in the sense of adapting well to stress and getting back to normal after stress, can thus be termed as a significant protective factor to health and development in adolescents.

Adolescents stand to gain the benefit of preventative healthcare services with respect to pediatric care that are delivered in prevention. The existing preventive care models are more and more focusing on holistic health by

incorporating counseling and psychosocial screening, health education and behavioral direction and emotional assistance into routine care. With the services, healthcare professionals can detect emotional vulnerabilities at an early stage, encourage adaptive coping mechanisms, and support adolescents to enhance their emotional and behavioral functioning. Pediatric preventive care can therefore be a viable source of resilience-building in adolescence.

Another significant aspect of the adolescent development that is highly interconnected with the emotional well-being is academic motivation. More resilient teenagers tend to be more confident, persistent, and involved in school life, whereas emotional distress and lack of coping abilities can lead to less concentration, less participation and academic perseverance. Despite the importance of adolescent mental health and prevention provided by evidence-based pediatric health care programs, the limited number of studies have investigated the impact of this intervention on both emotional strength and academic motivation at the same time.

Thus, the current research assesses the efficacy of evidence-based adolescent healthcare programs based on the Emotional Resilience Score (ERS) as the main outcome measure in the context of the pediatric preventive care services. It also looks into the correlation between emotional resilience, academic motivation and preventive care participation. The main impact of this research is in showing that preventive pediatric care contributes to better psychosocial resilience and educational motivation, and helps to introduce resilience-building and counseling interventions to adolescent health care.

## **2. Literature Review**

Emotional resilience is being considered as highly important factor of adolescent psychosocial development and their well-being. It means having a capacity to endure stress, to adjust to the change, to recuperate after the failure, to stay emotionally balanced in the unfavorable conditions. The adolescent stage of development is one of the most delicate stages since it is a period where adolescents are pressured by school, their peers, parents, emotional swings, and identity-related issues that may have devastating effects on mental health and social adaptation. The research has revealed that, adolescents with a stronger resilience can manage distress better, are more confident and can constructively respond to stressors compared to those with low resilience who experience anxiety, poor coping, emotional instability, and less involvement in the daily functioning [1], [2]. Moreover, negative events like loneliness, social isolation and risky behaviors have also been identified to cause worse mental health outcomes among adolescents, which support the necessity of interventions that enhance resilience in adolescents [3], [4].

There is a growing trend of pediatric preventive healthcare moving away not only toward physical health monitoring but also towards a larger paradigm, encompassing emotional, behavioral, and psychosocial health. Modern preventive healthcare services provide recurring interactions between teenagers and medical practitioners, which provide chances to detect issues related to mental health, counseling necessity, stress in school, and risky behaviors in terms of health. As an intervention to enhance long-term child and adolescent health, there has been a recommendation to integrate behavioral health into primary and pediatric care [5], [6]. Preventive healthcare services including counseling, health education, emotional counseling, and follow-up could thus serve as a valuable platform on resilience building. The prevention science also indicates that with well-designed health care models, structured evidence-based interventions are more likely to yield meaningful psychosocial and behavioral benefits [7].

The currently available research suggests that emotional well-being is strongly connected with academic motivation and school engagement. Teenagers who undergo emotional distress, lack coping skills, or confidence tend to complain about decreased focus, less active in classroom activities, and diminished perseverance in schoolwork. Conversely, emotionally strong teenagers have a high probability of exhibiting good self-efficacy, greater goal orientation and enhanced adaptation to school requirements [1], [8]. School-based and social-ecological support models have shown that resilience-enhancing environments can lead to education functioning and motivation as well as just to emotional stability [8]. Moreover, family functioning, behavioral health patterns, and psychosocial support system also affect various aspects of coping capacity and academic adjustment in adolescents, and it shows that emotional resilience and motivation are contextually conditioned by various factors [9].

Although these developments have been made, there is still a significant gap in the literature that relates to combining pediatric preventive healthcare, emotional strength, and academic motivation into one evidence-based intervention. Research in this field has frequently addressed behavioral health promotion [5], school resilience models [8], adolescent risk behaviors [4], or a particular area of intervention such as smoking cessation [10] but less has been done to directly answer the question of whether or not structured pediatric preventive healthcare programs can serve both to enhance emotional resilience and academic motivation. Additionally, the concept of resilience is frequently discussed, but not measured using a quantitative measure in intervention studies based on healthcare. Thus, this study will fill this gap by considering the Emotional Resilience Score (ERS) as one of the key results to assess the success of evidence-based adolescent healthcare programs provided within the framework of pediatric preventive care services. By connecting the involvement in preventive care with emotional well-being and educational motivation, the study adds to the more comprehensive conceptualization of adolescent healthcare to cover not only the physical health but also the psychosocial and educational outcomes.

### 3. Materials and Methods

#### 3.1 Study Design and Setting

The research design was a quasi-experimental pre post study intervention design, and was used to assess the effectiveness of evidence based adolescent healthcare interventions in enhancing the emotional resilience and academic motivation as a result of pediatric preventive care services. Research was done in school based pediatric preventive care clinics and community-based adolescent health centers where adolescents received regular preventive health care, counseling and wellness advice. These health care facilities were selected due to the sustained exposure to teenagers and opportunity to incorporate psychosocial and educational therapy into regular pediatric practice. The intervention and the assessment timeframe were more than six months, which allowed the study to compare the difference in the emotional resilience and academic motivation levels in the pre- and post-participatory groups in the healthcare program.

#### 3.2 Study Participants

There was a sample of 240 teenagers aged 12-18 years. Sampling was done purposely by the participants whose children regularly attend the sampled preventive care centers that provide pediatric care. The adolescents were eligible when they were receiving preventative health services, were capable of comprehending and filling in the study questionnaire, and ready to take part with parental or guardian permission where necessary. Study excluded those who missed the program by having incomplete questionnaire responses, severe psychiatric or cognitive disorders which would have interfered with the participation and those who were irregularly attending the program. Figure 1 describes the recruitment process, screening and inclusion, and completion of the participants.

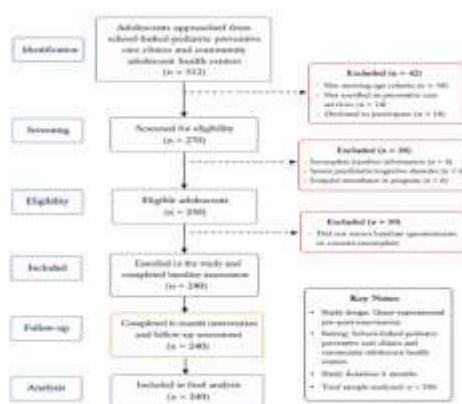


Figure 1. Participant Recruitment and Selection Flow Diagram

### 3.3 Intervention / Healthcare Program Components

The evidence-based adolescent healthcare initiative comprised a number of preventive and psychosocial support modules that were aimed at enhancing emotional stability and boosting academic motivation. These were regular preventive health check-ups, emotional counseling, stress management and coping-skills counseling, and sleep, nutritional, self-care, and school-life balance health education. Moreover, referral support was offered to adolescents who needed additional psychosocial support, and follow-up visits were carried out to support the suggested strategies of emotional and behavioral health. Figure 2 depicts the broad structure and the elements of delivery of the intervention.

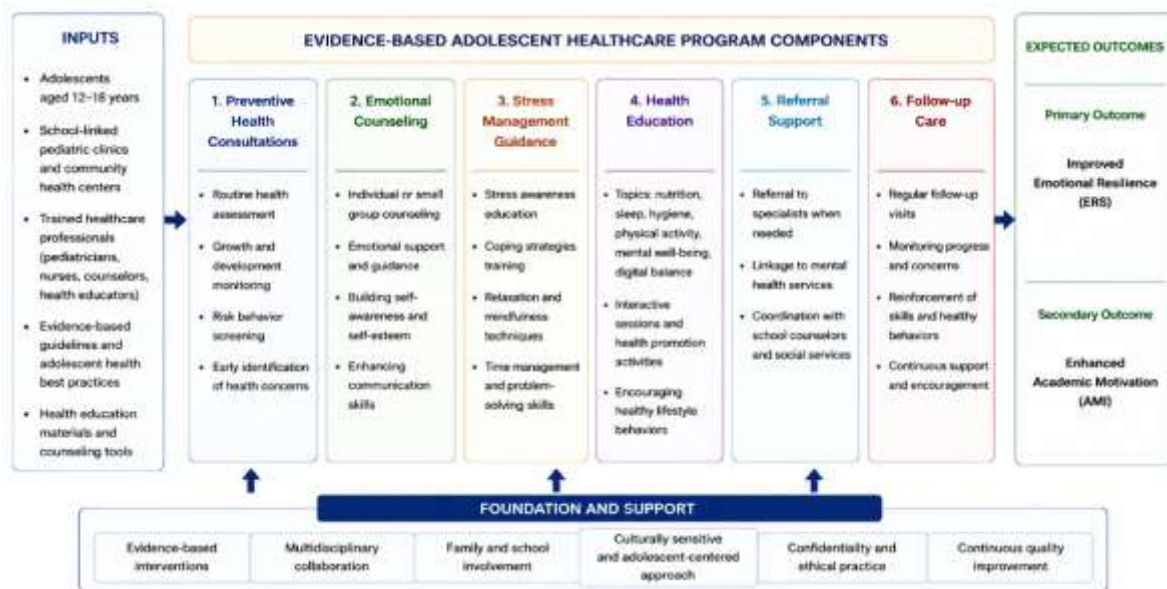


Figure 2. Evidence-Based Adolescent Healthcare Program Framework

### 3.4 Study Variables and Instruments

The structured self-administered questionnaire was used to collect data aimed at measuring key variables of the study. The major outcome measure was the Emotional Resilience Score (ERS) and the secondary outcome measure of the study was the Academic Motivation Index (AMI). The Preventive Care Participation Score (PCPS) was considered the main independent variable representing the level of engagement in the healthcare program. Other covariates were age, gender, attending schools, frequency of attendance of counseling, level of parental support and health literacy. The questionnaire consisted of four parts, sociodemographic information, ERS, AMI, and PCPS. ERS measured emotional coping, adaptability and post-setback recovery; AMI measured learning interest and academic persistence; and PCPS assessed involvement in preventive care activities. All of the scores on the scale were rescaled to the 0–100 scale, with the higher the score, the more resilient, academically motivated, or preventive care the patient. Table 1 provides a summary of the variables, questionnaire areas and scoring framework.

Table 1. Study Variables, Questionnaire Domains, and Scoring Structure

| Variable / Instrument            | Type            | Description                                                                                             | Items | Scoring / Interpretation                                                              |
|----------------------------------|-----------------|---------------------------------------------------------------------------------------------------------|-------|---------------------------------------------------------------------------------------|
| Emotional Resilience Score (ERS) | Primary outcome | Measures coping with stress, emotional regulation, adaptability, confidence, and recovery from setbacks | 10    | 5-point Likert scale; converted to 0–100. Higher score = greater emotional resilience |

|                                            |                      |                                                                                                      |   |                                                                                                                        |
|--------------------------------------------|----------------------|------------------------------------------------------------------------------------------------------|---|------------------------------------------------------------------------------------------------------------------------|
| Academic Motivation Index (AMI)            | Secondary outcome    | Measures learning interest, participation, persistence, and educational goal orientation             | 8 | 5-point Likert scale; converted to 0–100. Higher score = stronger academic motivation                                  |
| Preventive Care Participation Score (PCPS) | Independent variable | Measures participation in preventive health visits, counseling, health education, and follow-up care | 8 | 5-point Likert / participation-based scoring; converted to 0–100. Higher score = greater preventive care participation |
| Covariates                                 | Control variables    | Age, gender, school attendance, counseling participation, parental support, and health literacy      | — | Recorded as direct response, categorical, or Likert-scale variables                                                    |

### 3.5 Validity, Reliability, and Data Collection Procedure

Experts in the fields of adolescent health, pediatrics, and public health were first consulted to determine the content validity of the questionnaire. A pilot study that included 30 adolescents was then undertaken to test the clarity, feasibility and internal consistency of the instrument. Good internal consistency was demonstrated with a Cronbach alpha of 0.87 on ERS, 0.84 on AMI, and 0.81 on PCPS, which is acceptable. Data were collected in two phases, that is, a baseline measurement that was conducted prior to the intervention and a post intervention test at six months using the same questionnaire. Trained research personnel were used to administer all the questionnaires in a supervised environment to ensure that all responses are complete and consistent.

### 3.6 Statistical Analysis and Ethical Issues.

The study was started with the approval of the institutional ethics committee. Participation was optional and where informed consent or assent were required, written informed consent or assent was obtained among the adolescents and the parents or guardians. Every piece of information about the participants was held in confidentiality and the data obtained were utilized in research purposes. Appropriate software was used to conduct statistical analysis. The characteristics of the participants and the variables of the study were summarized using descriptive statistics. A paired t-test was used to compare the results of pre- and post-intervention ERS and AMI, and Pearson correlation analysis was employed to illustrate the correlations between ERS, AMI, and PCPS. Besides, multiple linear regression was carried out to determine the predictors of ERS. It took the level of statistical significance as  $p < 0.05$ .

## 4. Results

### 4.1 Participant Characteristics

The final analysis involved 240 adolescents and all the affected adolescents were subjected to both the baseline and the post intervention assessment. The population of the study was adolescents of 12-18 years of age with the greater part of participants of the middle adolescent age category. The sample size was balanced with both males and females hence a suitable sample to examine the effects of the preventive healthcare program. The engagement in pediatric preventive care services, counseling participation, as well as health education activities exhibited by participants at baseline showed a variation based on the initial exposure to the structured healthcare support. On balance, the profile of the participants showed that the sample of the study subjects was an objective because it included those adolescents who regularly visited school-based preventive care clinics and community adolescent health centers.

### 4.2 Pre–Post Improvement in Emotional Resilience Score and Academic Motivation

The adolescent healthcare program based on evidence yielded substantial gains in both Emotional Resilience Score (ERS) as well as the Academic Motivation Index (AMI) at the end of the six-month intervention. The overall ERS was at 61.84 with a standard deviation of 10.72 prior to the intervention and 78.46 with a standard deviation of 9.15 after

the program thus showing significant improvement in the ability of adolescents to cope with stress, emotional regulation and overcome setbacks. Likewise, the mean AMI at baseline was  $64.27 \pm 11.03$  which changed to  $80.12 \pm 8.67$  in the post-intervention phase indicating that there was a significant improvement in academic interest, persistence and motivation towards school-related activities. Table 2 shows a pre- and post-intervention compared ERS and AMI, and Figure 3 shows the mean improvement in ERS. The statistical analysis proved that these changes were very significant ( $p < 0.001$ ) and, thus, the engagement in the preventive pediatric healthcare program had a significant positive impact on psychosocial resilience and academic motivation.

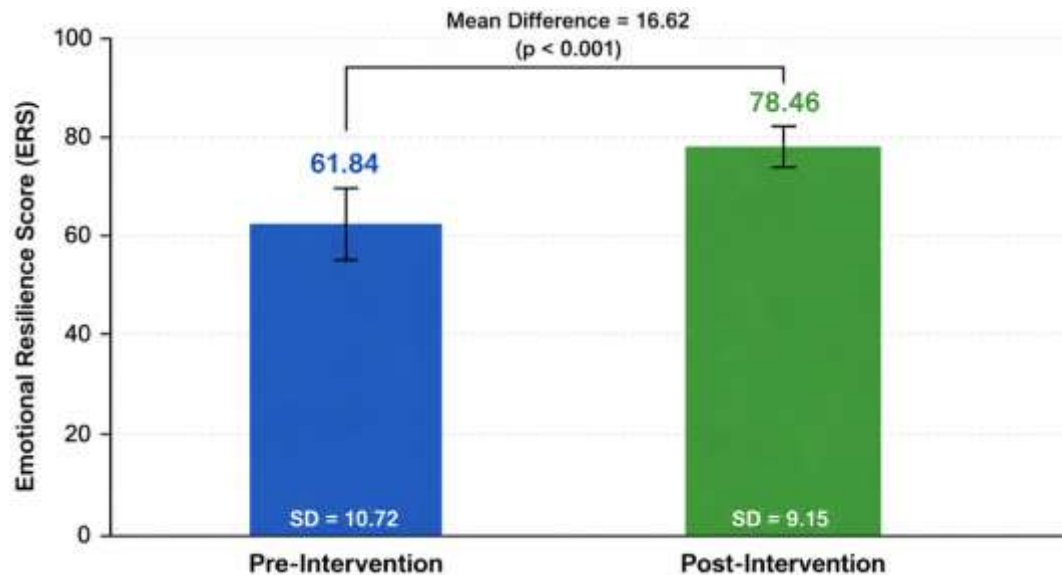


Figure 3. Pre- and Post-Intervention Mean Emotional Resilience Score (ERS)

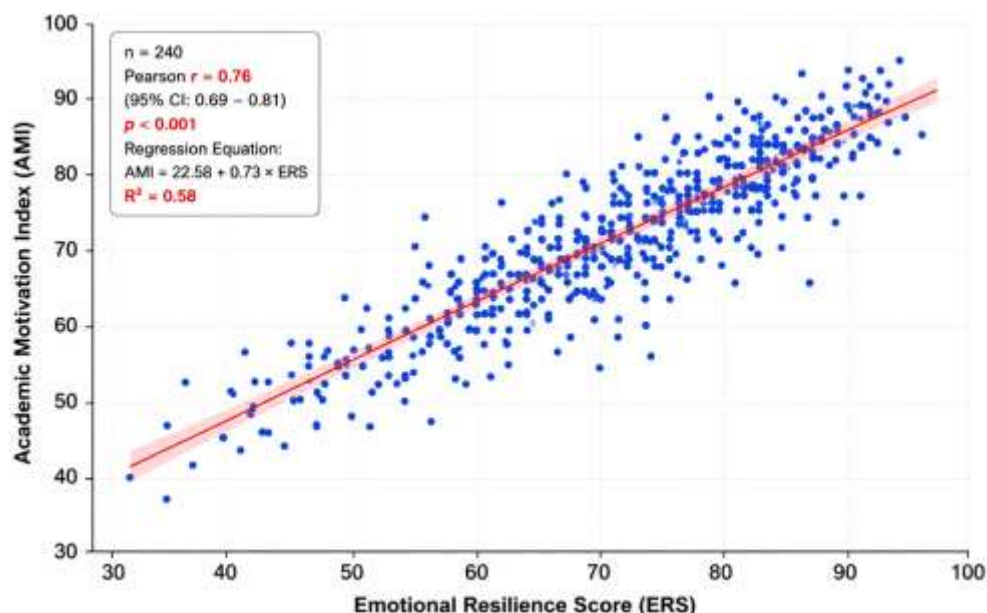
Table 2. Pre- and Post-Intervention Comparison of ERS and AMI

| Variable                         | Pre-Intervention Mean $\pm$ SD | Post-Intervention Mean $\pm$ SD | Mean Difference | t-value | p-value |
|----------------------------------|--------------------------------|---------------------------------|-----------------|---------|---------|
| Emotional Resilience Score (ERS) | 61.84 $\pm$ 10.72              | 78.46 $\pm$ 9.15                | 16.62           | 18.74   | < 0.001 |
| Academic Motivation Index (AMI)  | 64.27 $\pm$ 11.03              | 80.12 $\pm$ 8.67                | 15.85           | 17.96   | < 0.001 |

#### 4.3 ERS-Based Interpretation and Correlation Findings

Subsequent elucidation of ERS demonstrated enhanced gateway of all significant resilience domains after the intervention. Teenagers were more able to cope with academic stress, manage their emotions, showed more confidence that they could deal with challenges, demonstrated greater adaptability to change, and better recovery rate following emotional setbacks following their involvement in the healthcare program. These improvements at the domain level suggest that the intervention not only enhanced the overall ERS value but also bolstered particular emotional coping skills that are critical to adolescent well-being and school operation. Table 3 summarizes ERS domain-wise changes in detail. Additional correlation analysis showed that there were positive strong associations between ERS and the other key study variables. ERS exhibited a strong positive correlation with AMI ( $r = 0.76$ ,  $p < 0.001$ ) and adolescents who were more emotionally resilient were also more likely to report higher levels of academic motivation. The PCPS also showed positive correlation with ERS ( $r = 0.71$ ,  $p < 0.001$ ) which indicated that high involvement in preventive care services was related with favourable emotional resilience outcomes. The correlation

among ERS, AMI is graphically presented in Figure 4, which demonstrates that there is a positive correlation between resilience and academic motivation.



**Figure 4. Scatter Plot Showing the Relationship Between Emotional Resilience Score (ERS) and Academic Motivation Index (AMI)**

**Table 3. Domain-wise Improvement in Emotional Resilience Score (ERS)**

| ERS Domain                           | Pre-Intervention Mean<br>± SD | Post-Intervention Mean<br>± SD | Mean<br>Difference | p-<br>value |
|--------------------------------------|-------------------------------|--------------------------------|--------------------|-------------|
| Coping with academic stress          | 12.41 ± 2.85                  | 15.76 ± 2.31                   | 3.35               | <<br>0.001  |
| Emotional regulation                 | 11.96 ± 2.74                  | 15.42 ± 2.28                   | 3.46               | <<br>0.001  |
| Confidence in handling<br>challenges | 12.18 ± 2.69                  | 15.58 ± 2.19                   | 3.40               | <<br>0.001  |
| Adaptability to change               | 12.65 ± 2.81                  | 15.93 ± 2.24                   | 3.28               | <<br>0.001  |
| Recovery from emotional<br>setbacks  | 12.64 ± 2.78                  | 15.77 ± 2.13                   | 3.13               | <<br>0.001  |

#### 4.4 Regression Analysis and Overall Findings

The analysis was conducted with the help of multiple linear regression to determine predictors of Emotional Resilience Score (ERS) in adolescents following the preventive healthcare program. The analysis revealed that Preventive Care Participation Score (PCPS), Academic Motivation Index (AMI), counseling frequency participation, and health literacy level were all important predictors of ERS. PCPS was found to be the most significant contributing predictor among these variables, which means that the best impact on emotional resilience outcomes was on the increase in preventive healthcare services. AMI also provided significant positive contribution that indicated that

those adolescents who were resilient in emotions were more prone to be able to uphold higher levels of academic motivation. Moreover, counseling attendance and health literacy played a significant role in enhancing resilience, which supports the significance of psychosocial support and health awareness among adolescents as part of prevention programs. Table 4 shows the significant values and regression coefficients in detail. On the whole, these results suggest that evidence-based preventive care pediatric intervention may be effectively used to promote emotional coping and academic motivation, as well as to argue that well-organized healthcare involvement, involvement in counseling programs, and health literacy significantly contribute to desirable psychosocial results in adolescents.

**Table 4. Multiple Linear Regression Analysis Predicting Emotional Resilience Score (ERS)**

| Predictor Variable                         | Unstandardized Coefficient (B) | Standard Error | Standardized Coefficient ( $\beta$ ) | t-value | p-value |
|--------------------------------------------|--------------------------------|----------------|--------------------------------------|---------|---------|
| Preventive Care Participation Score (PCPS) | 0.38                           | 0.06           | 0.34                                 | 6.42    | < 0.001 |
| Academic Motivation Index (AMI)            | 0.29                           | 0.05           | 0.31                                 | 5.88    | < 0.001 |
| Counseling participation frequency         | 1.84                           | 0.52           | 0.19                                 | 3.54    | 0.001   |
| Health literacy level                      | 1.27                           | 0.48           | 0.14                                 | 2.65    | 0.009   |
| Constant                                   | 12.46                          | 4.18           | —                                    | 2.98    | 0.003   |

## 5. Discussion

The results of this study demonstrate that adolescent healthcare programs rooted in evidence based on the use of pediatric preventive care services, can go a long way in enhancing both emotional resilience and academic motivation among adolescents. The significant improvement of Emotional Resilience Score (ERS) is evidence that the intervention empowered the adolescents to respond better to stress and manage emotions and overcome failures, and the growth of the Academic Motivation Index (AMI) is evidence that it positively influenced their engagement and persistence in school. The close positive correlations among ERS, AMI and Preventive Care Participation Score (PCPS) further underscore the significance of habitual engagement in preventive healthcare practices in facilitating the psychosocial well-being. Regression analysis also indicated that significant predictors of ERS included PCPS, AMI, counseling participation and health literacy, which highlights the importance of considering resilience as a factor dependent on the engagement with healthcare and supportive psychosocial factors. On balance, the research contributes to the concept of counseling, resilience-building interventions, and academic support as a standard part of preventive healthcare being offered to adolescents to enhance their well-being. Nevertheless, the results can be viewed through the prism of such limitations as the quasi-experimental study, self-reporting, and very little external validity.

## 6. Conclusion

This paper is able to conclude that evidence-based adolescent healthcare programs provided through pediatric preventive care services can make a great difference in enhancing the emotional resilience and academic motivation of adolescents. The significant change in Emotional Resilience Score (ERS) indicates that organized preventive healthcare programs can enhance the ability of adolescents to handle stress, manage their emotions, adjust to the difficulties, and overcome failures. Meanwhile, the positive change in academic motivation signifies that resilience-based healthcare intervention can also be involved in enhanced educational persistence and school involvement. The fact that there are positive correlations between ERS and Academic Motivation Index (AMI) as well as Preventive Care Participation Score (PCPS) only underlines the significance of applying the counseling and psychosocial support

measures alongside resilience-building interventions to the regular care of adolescents. Altogether, the results indicate the value of preventive care among children as the most beneficial platform to both physical and emotional well-being and academic progress in adolescence.

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