



Research article

The negative association of perceived stress with adolescents' life satisfaction during the pandemic period: The moderating role of school community support

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ABSTRACT

Purpose: To analyze the association of perceived stress on the life satisfaction of Chilean adolescents during the recent pandemic, and to evaluate the moderating role that school community support provides.

Methods: A total of 1337 adolescents in Chile (56.6% females), aged 14 through 19 ($M = 15.99$; $SD = 1.3$) participated. Descriptive statistics, a multiple linear regression model, and moderation analysis were all employed.

Results: Females were associated with lower levels of Life Satisfaction ($B = -0.19$, $p = .042$), which was not the case for the Age variable ($p = .160$). The level of Perceived Stress was shown to have a negative association on Life Satisfaction ($B = -1.93$, $p < .001$). The moderation analysis revealed an interaction factor between Perceived Stress and School Community Support as predictors of Life Satisfaction ($B = 0.37$, $t = 4.91$, $p < .001$), showing that higher levels of School Community Support moderated the negative effect of Perceived Stress on Life Satisfaction.

Conclusions: Perceived stress during the pandemic had a negative association on life satisfaction. School community support was a protective factor for this negative effect, even in the case of online classes due to school closures. Strengthening the connection between adolescents and their school communities along with providing additional tools and resources in support of such a connection are both essential.

1. Introduction

In March 2020, the Coronavirus (COVID-19) pandemic was declared worldwide, forcing containment measures against the spread of contagion, such as home confinement and social distancing [1]. For children and adolescents, this included the suspension of in-person classes, the use of online platforms, and various alterations at the individual, social, and economic levels [2]. These include, for example, limitations on direct contact with relatives, friends and peers, and multiple restrictions placed on daily life. Such measures generated significantly higher stress levels, affecting different contexts of people's vital development [3,4]. Recent systematic reviews of the literature on the psychological impact of COVID-19 on children and adolescents indicate an increase in behavioral and emotional

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problems, lower quality of life levels, along with higher levels of depressive symptoms and perceived stress. These issues are heightened for those currently in a later stage of adolescence, especially females [5].

1.1. *Pandemic period and its effects on perceived stress in adolescents*

Although the COVID-19 pandemic period affected the entire population, it created an especially stressful situation for the adolescent population [6]. The increased experience of danger and overburdened of the personal resources and capacities was another, which simultaneously impacted self-confidence in one's ability to face challenges or difficulties [7]. These key dimensions are critical in the development stages of childhood and adolescence [8].

This is especially relevant, considering that available evidence reports that elevated stress levels have serious effects on physical, psychological, and social health, as well as a greater risk of developing anxious and depressive psychopathology, particularly during a stage of adaptation and transition to adult life, which is the essence of adolescence [7,9,10].

1.2. *Perceived stress and its negative effects on life satisfaction in adolescence*

Satisfaction with life is understood as a process of cognitive evaluation of everyday circumstances, according to the various domains in which it takes place (personal, friendship, family, school, neighborhood, etc.). This indicator is widely used to assess the quality of life and well-being of adolescents in various circumstances and contexts [11]. Advances in the study of life satisfaction in childhood and adolescence provide abundant evidence regarding its association with a wide range of physical, emotional, and social indicators of positive human functioning, demonstrating that such cognitive assessment is a key factor in child and adolescent development [12].

Specifically, the international literature provides copious evidence on the association between life satisfaction in adolescence and better physical and mental health indicators, lower drug and alcohol use, higher academic performance, and positive relationships in school, in addition to playing a protective role in the face of stressful situations and socioeconomic vulnerability [13,14]. The literature reports, however, that low levels of life satisfaction in adolescent and child populations are associated with negative psychological and social outcomes. These include proliferating violence and aggression, increased risk of suicide and depressive symptoms, low self-esteem, and conflicting social relationships [15,16].

Available evidence also discusses the negative association between exposure to stress and the subjective experience of life satisfaction in childhood and adolescence [17]. A recent study conducted in the adolescent population [18] concluded that a higher level of perceived stress was related both directly and indirectly to a decreased life satisfaction, by increasing the likelihood of developing risky behaviors like alcohol and drug use. This can be understood considering the fact that high stress levels are often associated with socio-emotional regulation mechanisms, as well as to a lower perception of quality of life in the adolescent population [19].

1.3. *Factors associated with levels of perceived stress in adolescence and the relevance of school*

Research outcomes show that adolescents' perceived stress levels are determined by several factors, such as personality, coping resources, and social support through a complex interrelationship between an individual's intrinsic and extrinsic factors, including genetic, psychological, social, cultural, and school determinants [20–22].

Furthermore, there is a growing line of study that highlights the relevance of the role of the school community in the adolescent population's perceived stress levels [23]. Indicating that the school climate and daily coexistence, the availability of extracurricular and sports activities, together with the perception of support from the school, teachers, and classmates function as key protective factors in maintaining low levels of perceived stress and higher levels of well-being for adolescents [23,24].

This can be explained by the positive effects of the school climate, the school support, and the teachers' capacity of taking care of their students and finding the right balance between monitoring them and providing autonomy, even after controlling for socioeconomic status and sex [25–28].

It was demonstrated that one effect of perceived support from the school community is to decrease the effects of perceived stress on adolescents' life satisfaction [29]. In addition, the support of teachers and classmates is positively associated with life satisfaction and has a moderating effect on the negative impacts of perceived stress in this population [30].

1.4. *The current study*

Despite advances in the study of the perceived stress and life satisfaction of adolescents and the school's role in this relationship, there is little evidence on the protective role of school in the face of high stress levels and significant effects on the social-emotional health of adolescents caused by the COVID-19 pandemic. It is essential to continue this line of research in order to understand the dynamics and effects that this period has entailed for the psychosocial functioning of the adolescent population and to provide evidence to support effective strategies for mitigating its consequences. Therefore, the objective of this study is to analyze the association of perceived stress levels on the life satisfaction of Chilean adolescents during the pandemic period and to evaluate the moderating role that school community support imparts to this association.

2. Method

2.1. Participants

A total of 1337 students (56.6% female) from the first to fourth year of secondary education (grades 9 to 12) participated. Their ages ranged from 14 to 19, with an average age of 15.99 (SD = 1.3). In terms of distribution by grade and gender of the participants, 26.4% belonged to 9th grade (54.7% female), 21.8% to 10th grade (57.2% female), 27.8% to 11th grade (57.3% female), and 23.9% to 12th grade (57.5% female).

Educational establishment selection was done using convenience sampling. Nine private and public establishments pertaining to three different regions in Chile participated.

The self-report questionnaire was applied between April and July 2021 at a time in Chile when substantial mobility restrictions and population confinement measures were in place. Schoolchildren attended classes online due to the COVID-19 pandemic and school closures mandated by the Government of Chile.

The Ethics Committee of the Universidad del Desarrollo approved this study. Data production was completed in coordination with each educational establishment after having first obtained passive informed consent from parents or guardians and active informed consent from students. The students of the schools belonging to grades 9 to 12 were previously invited to participate in the study during the regular online class period, being included in the study all those who voluntarily agreed to participate, those that were in the virtual classroom at the time of the application and those who did not have a refusal to participate by their parents. The data collection exercise lasted 45 min on average and was performed by the research team by sending the access link to the questionnaire available on the Alchemer Survey platform during the regular online class schedule.

Among the total number of students attending the online classroom during the application of the study ($n = 1459$), 8.37% did not answer and did not start the questionnaire ($n = 122$).

2.2. Measures

2.2.1. Demographic variables

Age and gender were included as sociodemographic variables. Age was included in years as a continuous variable and gender as a dummy variable (0 = male; 1 = female).

2.2.2. Student's Life Satisfaction Scale (SLSS)

An instrument created by Huebner [31] to measure overall life satisfaction in children and adolescents aged 8–18 years, which has been validated by Alfaro et al. [12] and has psychometric properties suitable for the Chilean adolescent population [32]. It evaluates the adolescents' satisfaction perceptions of several areas of their lives over the last two weeks through the degree of agreement with the following statements: "My life is going well", "My life is as I want it to be", "I have a good life", and "I have what I want in life". A 4-item Likert-type scale was used in this study with a response range from 0 to 10 points (0 = Totally Dissatisfied; 10 = Totally Satisfied) and has high reliability (Cronbach's Alpha = .90).

2.2.3. Perceived stress scale (PSS)

The Perceived Stress Scale (PSS) is an instrument developed by Cohen, Kamarck, and Mermelstein [33], widely used for assessing stress in the face of various daily experiences along with the degree of control people have over the situations they are immersed in. The 10-item version was used in this study [34], with a Likert-type response scale with a range of 1–5 points that evaluates the frequency of stressful feelings and thoughts over the last month (1 = never; 5 = very often). Higher scores mean a higher level of perceived stress. Some of the items are: "How often have you felt nervous or stressed?", "How often have you felt that difficulties were piling up so high that you couldn't overcome them?", and "How often have you felt unable to control the important things in life?". Since this instrument has not been validated in the Chilean adolescent sample, we performed a confirmatory factor analysis using R Studio software, resulting in adequate psychometric properties and adjustments in the sample of the present study (CFI = 0.954; TLI = 0.94; RMSEA = 0.07; SRMR = 0.05). The scale demonstrated high reliability in this study (Cronbach's Alpha = .86).

2.2.4. School community support

This 3-item Likert scale was developed *ad hoc* during the pandemic period under the framework of the International Survey of Children's Well-Being (ISCWeB) questionnaire. It evaluates the adolescents' perceptions of support from school, teachers, and classmates by degree of agreement ranging from 1 to 4 points (1 = I have never felt supported; 4 = Always) as concerns the following statements: "I felt supported by my classmates during the pandemic", "I felt supported by my teachers during the pandemic", and "I felt supported by my school during the pandemic." The scale showed adequate internal consistency for this study (Cronbach's Alpha = .78).

The full questionnaire in English is available as supplementary material.

2.3. Statistical analysis

Descriptive statistics and the Pearson correlation coefficient between the different variables were used and a multiple linear regression model was applied to examine the association of perceived stress on life satisfaction as a dependent variable. This also

enabled the analysis of protective and risk factors [35]. The linear regression analysis was performed by incorporating the model's predictive variables in the following order [36]: Gender, Age, Stress Level perceived by adolescents, School Community Support, and the interaction between the last two variables. Additionally, the Perceived Stress and School Community Support variables along with their interaction were centered on their mean in order to avoid multicollinearity [35]. Lastly, the moderation analysis was done using the results of the multiple linear regression model and the interaction between Perceived Stress and School Community Support, with the two-way interaction effects for standardized variables plotted thereafter [35]. The hypothesis testing was performed with a 95% confidence level. All data were analyzed using SPSS version 27 software.

3. Results

3.1. Descriptive and correlational statistics

Within the descriptive analysis, as shown in Table 1, the Life Satisfaction scale mean was medium-high ($M = 6.76$; $SD = 2.11$). The Perceived Stress level was high ($M = 2.95$; $SD = 0.67$) and the School Community Support mean level of the sample was 2.43 ($SD = 0.80$). In addition, a Pearson correlation analysis between the Gender, Age, Life Satisfaction, Perceived Stress, and School Community Support variables was incorporated (Table 1). The results show that Age is positively correlated with the level of School Community Support ($p < .01$), but not with the levels of Life Satisfaction or Perceived Stress. Regarding Gender (female), a very significant negative correlation ($p < .001$) with Life Satisfaction and School Community Support is observed, as well as a strongly significant positive correlation with levels of Perceived Stress ($p < .001$). Lastly, it is shown that the levels of Life Satisfaction correlated negatively and strongly with the levels of Perceived Stress ($p < .01$) and positively with the level of School Community Support ($p < .01$). All correlations presented in the expected direction.

3.2. moderation analysis and Multiple linear model of Perceived Stress and School Community Support on life satisfaction

As demonstrated in Table 2, a regression analysis with a moderator was performed, taking the Student's Life Satisfaction Scale as a dependent variable. Age, Gender, Perceived Stress, and School Community Support served as predictors, and the interaction of the latter two variables became the model moderator.

When analyzing the association of sociodemographic variables, the Gender variable is shown to have a negative and significant association on Life Satisfaction ($B = -0.19$, $p = .042$). As for Age, no statistically significant association was observed ($p = .160$). Furthermore, the level of Perceived Stress had a negative and statistically significant association on Life Satisfaction ($B = -1.93$, $p < .001$). Its association on Life Satisfaction was positive in the case of School Community Support ($B = 0.37$, $p < .001$). This model as a whole accounted for 48.2% of the variance for Life Satisfaction (Adjusted $R^2 = 0.482$). In relation to the diagnosis of collinearity of the independent variables, the estimation through the Durbin-Watson statistic had a value of 1.98, in addition the Variance Inflation Factor (VIF) values were close to 1 in all the variables (Range from 1.007 to 1.279), which indicates that there is no multicollinearity or autocorrelation in the variables of the model [35].

Regarding the moderation analysis shown in Table 2, the interaction factor of the Perceived Stress and School Community Support variables was statistically significant in the model ($B = 0.37$, $t = 4.91$, $p < .001$). Finally, as shown in Fig. 1, the simple slope analysis demonstrates that adolescents with high levels of Perceived Stress and School Community Support (+1 SD from the mean) have higher levels of Life Satisfaction. However, this protective effect was not observed in the case of low levels of Perceived Stress, regardless of the level of School Community Support. When comparing the stress and satisfaction connection between students with high and low School Community Support, the former group presents a smaller reduction in well-being in relation to high stress levels.

4. Discussion

The results show that the adolescents' Perceived Stress levels during the pandemic period had a negative and statistically significant association on Life Satisfaction. This is consistent with other research that has reported the harmful association of perceived stress on psychosocial functioning, health, and life satisfaction not just for adolescents, but for adults and children as well [21,23].

A positive association on Life Satisfaction caused by School Community Support levels was detected, which is consistent with research conducted before the pandemic [29,30]. School Community Support turned out to be statistically significant as a moderator of the relationship of Perceived Stress on Life Satisfaction for adolescents with high Perceived Stress levels. This finding is remarkable

Table 1
Descriptive Statistics and Pearson correlations among study variables.

	Range	M	SD	1	2	3	4	5
1. Gender (female)	0–1	0.57	0.49	–				
2. Age	14–20	15.99	1.30	–0.01	–			
3. Life Satisfaction	0–10	6.76	2.11	–0.28**	0.01	–		
4. Perceived Stress	1–5	2.95	0.67	0.38**	0.02	–0.67**	–	
5. School Community Support	1–4	2.43	0.80	–0.13**	0.08*	0.35**	–0.32**	–

Note: * $p < .01$, ** $p < .001$; SLSS = Students' Life Satisfaction Scale.

Table 2
Multiple linear model for Life Satisfaction Scale as dependent variable.

	Unstandardized Coefficients		<i>t</i>	<i>p</i>	<i>R</i> ²
	B	SE			
Intercept	6.37	0.56	11.34	.000	.482
Gender (female)	−0.19	0.09	−2.03	.042	
Age	0.04	0.03	1.40	.160	
Perceived Stress	−1.93	0.07	−26.89	.000	
School Community Support	0.38	0.05	6.86	.000	
Perceived Stress X School Community Support	0.37	0.07	4.91	.000	

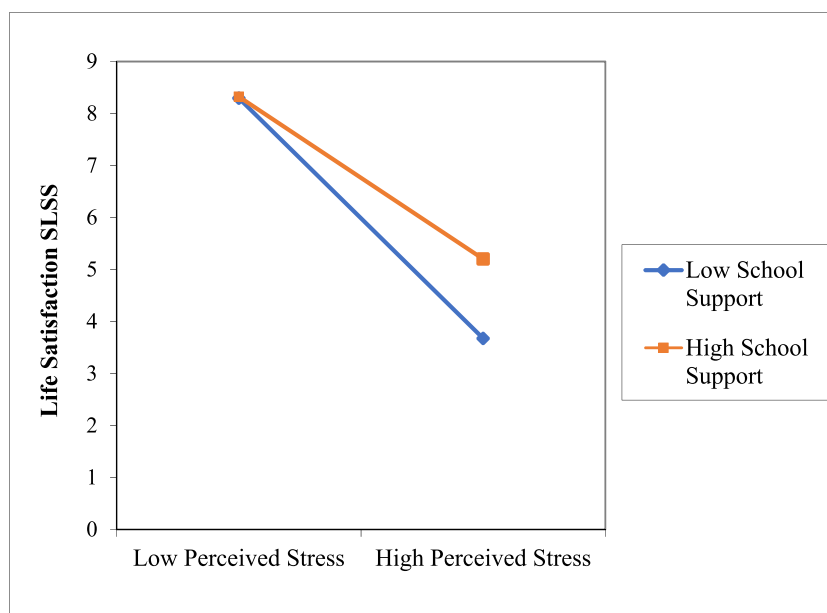


Fig. 1. Moderation plot of school community support for the total sample. Notes: Low School Community Support = −1 Standard Deviation, High School Community Support = +1 Standard Deviation; SLSS = Students' Life Satisfaction Scale.

because the data were collected during periods of home confinement with online classes, demonstrating the relevance of school even in distance-learning contexts.

Regarding gender, the females reported higher levels of Perceived Stress and lower levels of Life Satisfaction compared to males. This has also been illustrated by various studies discussing the differences that these effects have in terms of gender [5,13,29].

At the same time, these results report that the Age variable did not have a significant relationship on Life Satisfaction. This contradicts known evidence regarding the influence that age has on life satisfaction, fluctuating between the different phases of child and adolescent development [37]. Therefore, this relationship must be further studied in order to evaluate and better understand these dynamics.

In terms of this study's objectives, evidence provided here supports the idea that perceived stress levels affected the adolescents' life satisfaction during the pandemic. This corroborates the propositions raised in recent studies that discuss the psychological and emotional impacts experienced by many adolescents because of the COVID-19 pandemic quarantines, especially due to the high levels of stress they had to endure [38].

In terms of evaluating the moderating role of School Community Support in the relationship between Perceived Stress and Life Satisfaction, the results of this study are in line with other recent research exhibiting the importance of school life during the pandemic [39]. They report on the negative impacts resulting from alterations to normal school system functioning coupled with student isolation caused by suspended classes and significant lifestyle changes [38].

Similar results were described in previous studies reporting on the negative association between exposure to stress and the subjective experience of life satisfaction in adolescence [17,18] as well as how contextual conditions concerning the quality of social support moderate this relationship [40]. More specifically, they are corroborated by studies reporting on the effects that school and the characteristics of everyday relationships that take place within it have on life satisfaction [25,26,30,41]. It is important to pay special attention to the protective role offered by support at school in the face of various kinds of risks, such as ones that stem from perceived stress, as addressed in this investigation.

This study's results provide pertinent evidence to help guide the design of reparative and mitigation measures for the COVID-19

quarantine effects on adolescents. They shed light on the particular risk where children and adolescents find themselves, and the urgent need to facilitate and enhance their access to protective measures. Additionally, it suggests that not all adolescents were affected equally. This concurrently depends on the contextual conditions of protection related to the niches of belonging, such as the family [4] and the school community especially [30,41]. This is highly relevant for public health, considering the greater impact on especially vulnerable populations, such as children and adolescents with special health needs and the presence of clinical symptomatology prior to the pandemic [42–44].

The evidence generated in this work along with others recent studies show the importance of reinforcing and strengthening the protective function that the perception of school support would have in the face of a pandemic's effects. More concretely, it gives a foundation to the importance of paying attention to school coexistence practices as a relevant resource for the capacity and competence of adolescents to deal with the pandemic and other general stressors they must face. In general terms, it suggests that improving support and social connection may serve as adequate measures to mitigate the pandemic's effects and any subsequent impacts on adolescent psychosocial functioning [7,10]. Ideally, these processes of social connection would promote quality connections that enable and encourage making use of available resources.

The results of this study assist in the empirical validation of the importance of making sure the educational system has the right tools and/or resources for managing high-stress contexts like the recent pandemic that everyone was immersed in. Useful resources would aid and guide the technical teams of educational establishments. This includes educators who work directly in the classroom, professionals who manage and direct local or national educational systems, as well as decision makers responsible for the implementation, design, and assessment of educational and social programs and policies aimed at children and adolescents. This would apply to health-related domains, comprehensive education, and socially vulnerable or at-risk groups.

4.1. Limitations

Our study has several limitations. First, the sampling was not probabilistic and the participants came from educational establishments in only three regions of Chile, so the results cannot be generalized to the entire Chilean adolescent population. In addition, other variables such as socioeconomic status, place of residence or number of days confined were not included in the analysis. Such aspects should be considered in future studies. Furthermore, the applied questionnaire was a quantitative self-report of adolescents, so future studies should consider and incorporate complementary qualitative analyses. Lastly, the cross-sectional design of the study limits the establishment of causality of the study variables and model, so future longitudinal studies should test this effect.

Despite its limitations, this study demonstrates the significance of school community support during the pandemic period as a protective factor against the association of stress levels with adolescents' life satisfaction. Strengthening the connection and support between school communities and adolescents is essential and of particular importance in contexts featuring high stress levels.

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Author contribution statement

Matias E. Rodríguez-Rivas: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Jaime Alfaro; Mariavictoria Benavente: Conceived and designed the experiments; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Jorge J. Varela; Fernando Reyes: Contributed reagents, materials, analysis tools or data.

Roberto Melipillán: Conceived and designed the experiments; Contributed reagents, materials, analysis tools or data.

Data availability statement

Data will be made available on request.

Declaration of interest's statement

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

The authors declare no competing interests.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.heliyon.2023.e15001>.

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