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Article

Relationship among perceived stress, life satisfaction and academic performance of Education Sciences students of the University of Jaén after the COVID 19 pandemic

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Abstract: The circumstances arising from the exceptional situation caused by the COVID-19 pandemic have affected all socioeconomic areas in the last two years. The field of Education has not been an exception and the management of the situation seems to have caused an increase in the level of perceived stress of university students. On this basis, this research that aims, first, to analyze the student's level of perceived stress during the de-escalation and return to normality period, secondly, to evaluate its relationship with life satisfaction and, finally, to detect the students' needs in stress management, has been developed. An exploratory-descriptive study of quantitative and cross-sectional nature has been carried out. 222 university students of the Childhood and Primary Education Degrees of the University of Jaén (Spain) have participated. The instruments, *Perceived Stress Scale* (PSS) and *Satisfaction with Life Scale* (SWLS) have been used. The results show a moderate and partial relationship among the dimensions of the used instruments. The obtained coefficients of determination are, Academic Performance (r^2 = .019) and Life Satisfaction (r^2 = .402), with a mean square error (SRMR) of .079. These findings show the need to develop actions within the university training program in effective stress management strategies.

Keywords: perceived stress, life satisfaction, academic performance, university students, stress management, COVID-19.

1. Introduction

Many students may be exposed to various situations that not only affect their academic performance, but also their mental health during their university training stage. In this vital stage, various pathological expressions such as depression, anxiety, down feelings and psychological stress are more frequent and, even more serious, than in others [1].

Although stress is a response to life changes and acts as a stimulus to take an action, it can be harmful when it becomes habitual and the individual no longer has the ability to address it [2]. This problem is linked to the interaction of various factors and the university stage is not disconnected to it. In fact, regardless of personal or social causes, there are some reasons own of the academic life that are significantly associated with the stress [3]. As [4] indicated, the impact of stress on students' daily lives should be part of the reflection on the educational process, since it can affect the professional training process and to its conclusion. In this reflective analysis, the responsibilities, roles and the educational and personal context of each student should be considered, since these variables could attenuate or accentuate the process of building the capacity to manage stress. Students, in their

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university stage, face constant challenges both their own and outside of their training. Regarding the academic environment, according to the development of the student, the work environment, the academic performance and the evaluation carried out, the perceived stimuli may be stressors or not [5-6].

Currently, there is one more possible agent that causes stress in university students: the global COVID-19 pandemic. Some scientific studies on the impact that confinement has had in the psychological field of quarantined populations have been carried out. For example, [7-9] Gamonal Limcaoco et al. (2020), Rossi et al. (2020) and Correa, Mola, Ortiz & Godoy (2021) among others, have investigated the variables that are related to perceived stress, such as age, gender, educational level, type of occupation, having people in charge and/or belong to a population at risk for COVID-19 (or having someone close to you who is risk population).

[10] carried out a study with the aim of determining the levels of stress, anxiety and depression in the first wave of the COVID-19 with a sample made up of 976 citizens from the north of Spain. These researchers found that the youngest group of the study population (18-25 years) had higher averages in stress, anxiety and depression compared to the other two groups (26-60 years and older than 60). They also noted that there was a greater psychological impact on those people with chronic illnesses.

[11] developed a study in Mexico to evaluate the levels of anxiety, depression, stress and the perception of their health status in university students after 7 weeks of confinement due to the COVID-19 pandemic. The data obtained by these researchers show that, during the confinement phase, practically a quarter of the study population, regardless of the sociodemographic variables, presented headache sense, a feeling of lack of control and little satisfaction with the way of performing their tasks. In addition, approximately a third of the population said that they felt overwhelmed, nervous, bad-tempered, less active, spending more time than usual performing daily tasks and with worthless feelings.

On the other hand, [9] carried out a study in Argentina, with a population made up of 6355 individuals aged 18 to 85 regarding the influence of the educational level on the effects of COVID-19 on people's stress. They found that people with university studies experienced lower levels of stress than people with primary education or without studies, pointing out that these results could be due to the fact that people with higher educational levels have greater access to better tools and skills to tolerate uncertainty and face the stress of a context like the current one.

In Italy, [8] conducted a survey on the web and conducted by 18,147 people (79.6% women) and found that, 3 weeks after the COVID-19 blocking measures, there had been high rates of negative mental health results in the Italian general population and different risks related to COVID-19, as depression, anxiety, insomnia or perceived stress, among others.

Similar studies have been carried out worldwide, for example, in China, [12] developed an investigation with a sample consisting of 1,210 participants during the first wave of the COVID-19 pandemic, which showed that the individuals surveyed had developed any of the following symptoms (moderate/severe): depression (16.5%), anxiety (28.8%), stress (8.1%) and a significant association ($p < 0.05$) between self-assessed health status with higher levels of stress, anxiety and depression, especially in female students. Along the same lines, [13] identified the presence of feelings of anxiety (35.1%), depression (20.1%) and problems in sleep quality (18.2%) during the first phase of confinement due to COVID-19 in a Chinese population.

All this confirms that experiences such as anxiety, stress, panic attacks, sleep disorders, anger or disappointment among others of the kind, are manifested in people due to confinement during pandemics [14]

Abovementioned, allowed us to realize that stress is a relevant variable in order to advance in the understanding of how the pandemic situation influences people in general and, specifically, on university students. Thus, in the present study we set out to analyze the relationship between perceived stress, life satisfaction and academic performance of Education Sciences students at the University of Jaén after the COVID-19 pandemic.

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To do this, starting from an initial theoretical model (Figure 1), where these three variables (perceived stress, life satisfaction and academic performance) are collected, the causes that specify how and why they are related and explained. The Partial Least Squares regression (PLS regression) of the route model is used, because it is a more flexible methodology (not requiring rigorous parametric assumptions), especially in the data distribution and sample size.

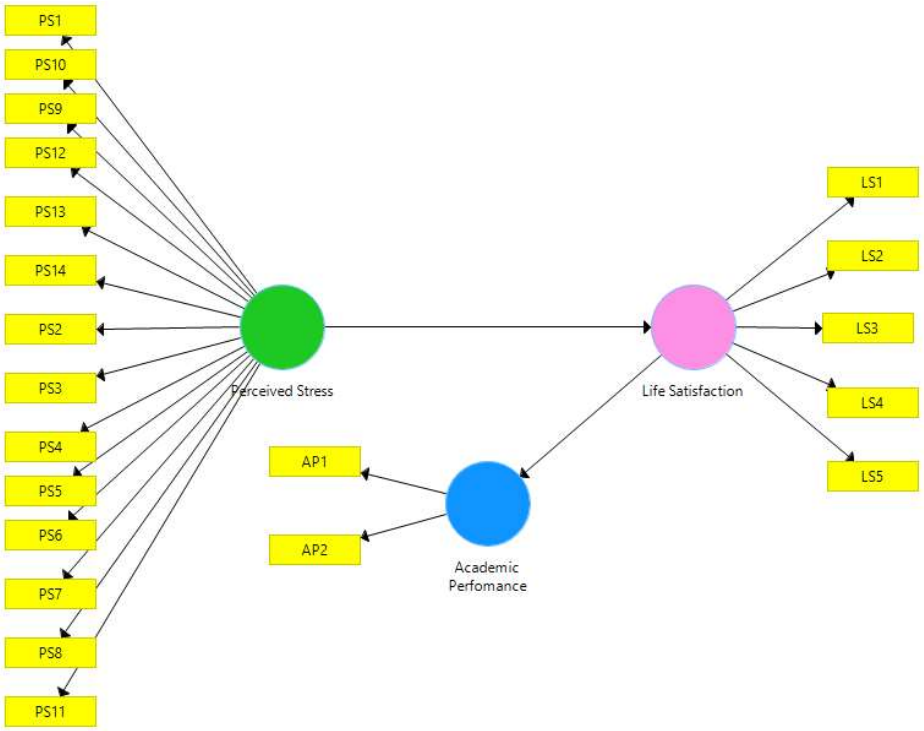

Figure 1. Initial causal model of perceived stress, life satisfaction and academic performance

The only starting hypothesis (H1) is the existence of a causal relationship between perceived stress and life satisfaction as predictive values of academic performance and expectations for improvement.

Both variables have been measured through the data on the academic results obtained during the pandemic and the beginning of the de-escalation and the expectations of improvement in the beginning of normality (face-to-face classes)

Based on the above, the objectives of this study were the following:

a) Study the existence of statistically significant correlations among the dimensions of the assessment for perceived stress (PSS-14), life satisfaction (SWLS) and academic performance.
b) Establish the existence of significant differences between the dimensions of the instruments considered and the sociodemographic variables (gender and educational level).
c) Analyze the causal relationship of perceived stress and life satisfaction on academic performance.

2. Materials and Methods

The present research is based on a quantitative, cross-sectional, non-experimental and correlational analysis. Based on these criteria, longitudinal, comparative and reliability measures are established through Cronbach's alpha and Omega coefficient [15], also called Jöreskog's Rho [16].

2.1. Procedure

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The questionnaire was distributed and the data were collected among the students of the Childhood and Primary Education Degrees of the University of Jaén (Spain) in September 2021 using the Google Form tool. Before it was carried out, an "explanatory sheet" was presented to the students, where the essential aspects of the research were indicated: who are the researchers, its purpose (study objectives) and its anonymity, confidentiality and voluntariness.

2.2. Sample

The sample is made up of 222 university students of the Childhood Education and Primary Education Degrees, belonging to the Faculty of Humanities and Sciences Education of Jaén (Spain). The selection of the sample was non-probabilistic and incidental. As shown in Table 1, the distribution of the participants (n = 222) by the taken Degree is as follows: 184 study Childhood Education (82.08%) and 38 study Primary Education (17.12%). Regarding the gender: 171 are women, (77.03%) and 51 men (22.97%).

Table 1. Percentage of respondents by degree and gender

Degree	
Childhood Education	**Primary Education**
82.08%	17.12%
Gender	
Male	**Female**
77.03%	22.97%

On the other hand, the average age of the participants is 22.02 (± 3.97) and the average grade during the pandemic (2020/2021 course) is 8.59 (± 8.88).

2.3. Research model

Partial Least Squares (PLS) technique was used to evaluate the proposed model. Thus, the structural design was analyzed to determine its validity, dimensionality and reliability, following the recommendations of Sarstedt and Cheah (2019) and analyzing the convergent validity, the factor loadings, the variance and the composite reliability [17].

Figure 2 shows the results obtained (threshold of 0.6) according to the criteria of [18]. Result that shows a partial convergent validity of the proposed model.

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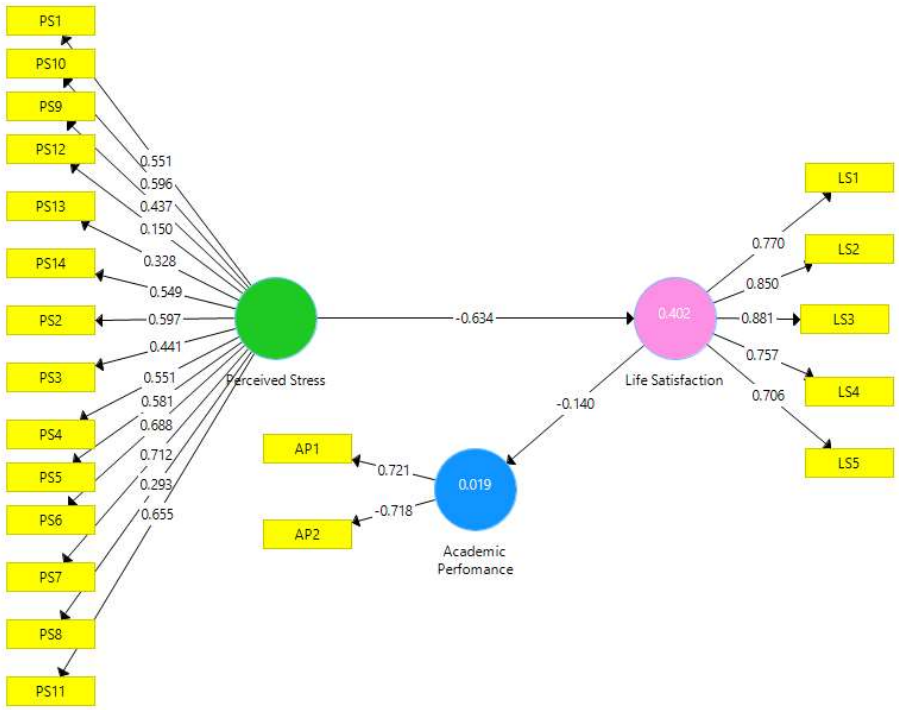

Figure 2. Causal model of Emotional Intelligence, Quality of Life and Life Satisfaction

2.3.1. Reliability and validity of the model

Table 2 shows Cronbach's alpha, Omega coefficient, external loads and the grades of the composite reliability index (CRI). In relation to the convergent validity obtained through the estimation of the average variance extracted (AVE), the values must be greater than .5, according to the criteria of [19]. That is, an AVE´s high value will have a better representation of the load of the observable variable.

Table 2. Research model results

Variable	α	ω	Composite Reliability Index (CRI)	Rho_A	Mean Extracted Variance (MEV)
PS	.79	.80	.83	.84	.283
LS	.84	.86	.89	.87	.633
AP	-	-	-	-	.517

Note: (1) Perceived Stress=PS; Life Satisfaction=LS; Academic Performance=AP.

2.3.2. Cross factorial loads

Table 3 shows the discriminant validity or level at which the elements differ, that is, when it is considered that there is a difference between variables [20].

The square root of the mean variance obtained is indicated in bold. This value must be higher than the values in each row and column respectively. To analyze the discriminant validity, factor loadings and cross factor loadings were obtained [21], knowing that -for there to be difference between variables- the factor loadings must be

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higher than the loads cross factorials [17]. Therefore, according to the theory, the indicators have to be more correlated with their own construct than with the others [20].

Table 3. Cross factorial loads

Variable	Academic Performance (AP)	Life Satisfaction (LS)	Perceived Stress (PS)
AP1	**.721**	-.101	.062
AP2	**-.718**	.100	-.025
LS1	-.078	**.770**	-.496
LS2	-.158	**.850**	-.523
LS3	-.160	**.881**	-.599
LS4	-.114	**.757**	-.453
LS5	-.020	**.706**	-.432
PS1	.005	-.270	**.551**
PS2	.055	-.359	**.597**
PS3	-.034	-.231	**.441**
PS4	-.016	-.303	**.551**
PS5	.032	-.400	**.581**
PS6	.047	-.358	**.688**
PS7	.099	-.628	**.712**
PS8	.042	-.076	**.293**
PS9	-0.80	-.188	**.437**
PS10	-.020	-.351	**.596**
PS11	.117	-.444	**.655**
PS12	-.084	-.087	**.150**
PS13	-.120	-.170	**.328**
PS14	.131	-.310	**.549**

Note: (1) Academic Performance= AP, Life Satisfaction=LS, Perceived Stress=PS

2.3.3. Hypothesis contrast

Table 4 shows the results of the *path coefficient* (standardized regression coefficient), following the criteria of [22], where the causal relationship with the latent variables can be observed.

The t-test was obtained (according to the bibliography, values higher than 1.96 indicate the coherence of the model). In this case, all the values obtained higher than 1.96

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except for those refer to the academic performance and the expectations for improvement. Data indicate that there is a significant negative relationship, as expected, between perceived stress and life satisfaction, with no causal relationship with academic performance and expectations for improvement. Therefore, the results obtained show the partial validity of the model.

According to [11], r^2 was used to measure the effect size, being the determination coefficient for Academic Performance and Life Satisfaction: $r^2 = .019$ and $r^2 = .402$, respectively, with a Standarized Root Mean-Square (SRMR) of .079. As indicated in the bibliography (Chin, 1998), a value of SRMR <0.08 is considered acceptable and a SRMR <0.05 is considered optimal.

Table 4. Path coefficient (standardized regression coefficient)

Relationship between variables			Path coefficient (β)	Standard deviation (σ)	t statistic	*p*
AP1	↔	Academic Performance	.721	.657	1.097	.273
AP2	↔	Academic Performance	-.718	.683	1.051	.294
LS1	↔	Life Satisfaction	.770	.042	.18.188	***
LS2	↔	Life Satisfaction	.850	.022	39.497	***
LS3	↔	Life Satisfaction	.881	.017	52.616	***
LS4	↔	Life Satisfaction	.757	.036	20.769	***
LS5	↔	Life Satisfaction	.706	.042	16.791	***
PS1	↔	Perceived Stress	.551	.062	8.865	***
PS2	↔	Perceived Stress	.597	.062	9.598	***
PS3	↔	Perceived Stress	.441	.075	5.840	***
PS4	↔	Perceived Stress	.551	.062	8.922	***
PS5	↔	Perceived Stress	.581	.059	9.894	***
PS6	↔	Perceived Stress	.688	.048	14.207	***
PS7	↔	Perceived Stress	.712	.033	21.473	***
PS8	↔	Perceived Stress	.293	.088	3.336	***
PS9	↔	Perceived Stress	.437	.077	5.708	***
PS10	↔	Perceived Stress	.596	.067	8.950	***
PS11	↔	Perceived Stress	.655	.044	15.023	***
PS12	↔	Perceived Stress	.150	.086	1.735	.083
PS13	↔	Perceived Stress	.328	.086	3.803	***
PS14	↔	Perceived Stress	.549	.062	8.880	***

Note: Life Satisfaction =LF, Emotional Intelligence =EI, Quality of Life =QL. (2) *=p<.05; **= p<.01; ***=p<.001.

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2.4. Instrument

As stated above, the research includes two sociodemographic variables in order to collect relevant information based on gender and degree studied, in order to analyze the possible existence of significant differences based on these.

Satisfaction with Life Scale (SWLS) and Perceived Stress Scale (PSS) unified in a single instrument of 19 items, were used, respectively, to measure perceived stress and life satisfaction.

First, to assess life satisfaction, the SWLS [23] was used; specifically the version of the Satisfaction with Life Scale by [24]. It is made up of five items (Table 5) where participants must indicate the degree of agreement or disagreement for each of the response options of the instrument. The scale in the Spanish version has an internal consistency of α = .82. The reliability of the scale scores in our sample is α = .84 and Omega coefficient ω = .86.

Table 5. *Satisfaction with Life Scale* ([24] *version)*

SWLS
1. My life is how I want it to be in most aspects.
2. My life circumstances are very good.
3. I am satisfied with my life.
4. So far, I have achieved the things that I consider important from life.
5. If I could live my life again, I would not change almost anything.

Secondly, to assess the students 'perceived stress the PSS [25-26] was used. This scale is made up of 14 items (Table 6), 7of which are in favor of control (e.g. " How often have I felt like I had everything under control?") and, another 7 in favor of loss of control (e.g. "How often have I been angry because things that happened to me were out of my control?"). In the factor in favor of control, the scores of items 4, 5, 6, 7, 9, 10, and 13 are inverted to assess the stress.

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Table 6. *Perceived Stress Scale* [25-26]

PSS
1. How often have I been affected by something that happened unexpectedly?
2. How often have I felt unable to control the important things in my life?
3. How often have I felt nervous or stressed?
4. How often have I successfully dealt with life's irritating little problems?
5. How often have I felt that I have effectively coped with the major changes that have been taking place in my life?
6. How often have I been confident about my ability to handle my personal problems?
7. How often have I felt that things are going well for me?
8. How often have I felt like I could not face all the things I had to do?
9. How often have I been able to control the difficulties in my life?
10. How often have I felt like I had everything under control?
11. How often have I been angry because things that happened to me were out of my control?
12. How often have I thought about the things that I still have to do?
13. How often have I been able to control the way I spend time?
14. How often have I felt difficulties accumulate so much that I cannot overcome them?

Items are evaluated using a 7-degree Likert-type gradient frequency scale: 1=Strongly disagree, 2=Quite disagree, 3=Disagreement, 4=Neither Agree or Disagree, 5=Agreement, 6=Pretty much agree, 7=Totally agree. The global score is obtained by adding the reversal of the scores of the positive items (characterized by having a positive statement) and the scores of the negative items [27].

The reliability of the scale scores in our sample is α = .79 and the Omega coefficient, ω = .80.

Taking into account the average grade obtained during the pandemic (2020/2021 academic year) and the expectations for improvement during the 2021/2022 academic year (in which the Childhood Education Degree and Primary Education Degree students have returned to face-to-face classes), the academic performance indicator is considered good to measure the academic aptitudes of university students in a global and precise way.

2.5. Data analysis

Data from the survey were encoded and analyzed using the SPSS 25.0 (IBM, Chicago, IL) y SmartPLS 3.3., using a confidence level of 95% (significance $p < .05$), to obtain the results of the tests indicated below.

Descriptive statistics (means and standard deviations) were obtained, analyzing a priori the reliability and internal consistency of each instrument (Cronbach's alpha and Omega coefficient) when working on the weighted sum of each variable and, thus, being able to overcome the limitations that could affect to the proportion of the variance [28] and to the correlation between the resulting scores in each of the dimensions.

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Next, a mean difference analysis according to gender and coursed Degree (Childhood Education or Primary Education) was developed using the *Mann-Whitney U test* of range difference for unrelated samples. Non-parametric tests have been used because the normality assumption was not fulfilled in all cases based on the data obtained in the *Kolmogorov-Smirnov* test. In addition, the effect size in the analyzes performed.is reported

Finally, the Partial Least Squares (PLS) approach was used to evaluate the theoretical model under study, previously having previously analyzed the latent variables (dimensionality, validity and reliability) with a Confirmatory Factor Analysis (CFA).

3. Results

The results obtained in accordance with the objectives of the investigation are shown below.

3.1. Relationship among perceived stress, life satisfaction and academic performance.

Table 7 shows the scores of the correlation matrix, descriptive statistics (mean -M- and standard deviation -SD-), reliability analysis (Cronbach's alpha -α - and Omega coefficient -ω -), where it can be observed, as expected, a statistically significant and negative relationship between the variables perceived stress and life satisfaction ($r_{(222)}$=-.543; p<.01).

Table 7. *Internal consistency, mean, standard deviation and Spearman's Rho correlation of the variables "perceived stress", "life satisfaction" and "academic performance"*

Variable	α		*M (SD)*	Perceived Stress	Life Satisfaction	Academic Performance
Perceived Stress	.79	.80	5.054 (±.962)	-	-.543**	-.034
Life Satisfaction	.84	.86	2.962 (±.414)		-	-.191
Academic Performance	-	-	8.597 (±8.881)			-

Note: (1) Mean = *M*, Standard Deviation= *SD*, (2) ** = p < .01.

3.2. Differences based on sociodemographic variables

3.2.1. Sociodemographic variable "gender"

The nonparametric *Mann-Whitney U test* for two independent samples was used to analyze the differences based on the sociodemographic variable gender (Table 8).

Results show that there are no significant differences between the variables *perceived stress* and *life satisfaction* in relation to *gender* (Z <2.0; p> .05 ns). On the contrary, there are significant differences between the variable *academic performance* and *gender* (Z = -2.472; p = .013). The value of r is used to calculate the effect size for this nonparametric test [r=Z/$\sqrt{n}$]. From the results obtained, it can be stated that, in this study, the effect size is small in all cases (r <.2) according to Cohen's criteria (1988).

Table 8. *Rank differences based on gender (Mann-Whitney U)*

Variables	Women	Men	*Z*	*p*	*Size Effect*

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	(*n*=171) *M (SD)*	(*n*=51) *M (SD)*			*(r)*
Perceived Stress	2.982 (±.417)	2.894 (±.400)	-1.433	.152	.132
Life satisfaction	5.037 (±.994)	5.109 (±.854)	-.203	.839	.018
Academic Performance	8.962 (±10.088)	7.373 (±.768)	-2.472	.013*	.222

Note: (1) Mean = *M*; Standard Deviation = *SD* (2) *Z* = Mann-Whitney U test; *p* = significance (3) Statistical effect size is expressed using Cohen's value. (3*) *=p<.05.*

3.2.2. Sociodemographic variable "taken Degree"

As in the previous case, the nonparametric *Mann-Whitney U test* for two independent samples was used to analyze the differences based on the sociodemographic variable taken Degree (Childhood Education and Primary Education) (Table 9).

Results show that there are no significant differences between the variables *perceived stress* and *life satisfaction* in relation to the *taken Degree* (Z <2.0; p> .05 ns). On the contrary, there are significant differences between the variable *academic performance* and *taken Degree* (Z = -2.017; p = .044). The value of r is used to calculate the effect size for this nonparametric test [r=Z/√*n*]. From the results obtained, it can be stated that, in this study, the effect size is small in all cases (r <.2) according to Cohen's criteria (1988).

Table 9. *Rank differences based on the taken Degree (Mann-Whitney U)*

Variables	**Childhood Education** *M (SD)*	**Primary Education** *M (SD)*	*Z*	*p*	*Size Effect (r)*
Perceived Stress	2.958 (±.415)	2.981 (±.416)	-.101	.919	.010
Life satisfaction	5.038 (±.969)	5.131 (±.9.38)	-.651	.515	.066
Academic Performance	7.925 (±.787)	8.564 (±5.468)	-2.017	.044*	.206

Note: (1) Mean = *M*; Standard Deviation = *SD* (2) *Z* = Mann-Whitney U test; *p* = significance (3) Statistical effect size is expressed using Cohen's value. (3*) *=p<.05.*

4. Discussion

The first objective of this research was to study the existence of statistically significant correlations among the dimensions perceived stress and life satisfaction in Childhood and Primary Education Degrees students at the University of Jaén (Spain) after the COVID 19 pandemic and if these dimensions could be used as predictive values of academic performance and expectations for improvement. Each of these relationships received empirical support, assuming that university students perceive the stress in a positive or negative way depending on their emotional state and context to face problems adaptively [29]. Overall, the obtained results show that perceived stress is negative and significantly related to life satisfaction, but not to academic performance.

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Related to this objective, the results found showed that perceived stress significantly correlated with life satisfaction in a negative way. These results coincide with what was stated by other authors such as [30], who found that adaptability to the university context is conditioned, directly and indirectly, with life satisfaction or [31], who state that students' perceived stress, their physical appearance, and positive or negative daily events are predictive of life satisfaction.

Regarding the second objective, "establish the existence of significant differences between the dimensions of the instruments considered and the sociodemographic variables (gender and educational level)", first, and taking into account the size of the sample, no significant differences were found between life satisfaction and gender.

With regard to the perceived stress and gender, no significant differences have been found between them, although it is observed that women obtain slightly higher scores in relation to the perceived stress and men, in life satisfaction. The difference obtained in the data on perceived stress between men and women may be conditioned by the current situation due to the COVID-19 pandemic, and with the different ways that women and men have of facing the constant challenges of university education such as previous works corroborate. So, in the academic field, [32-33] observed that according to the student's development, the perceived stimuli may or may not be stress generators, estimating that male students presented lower levels of stress than female ones.

As regards the relationship between perceived stress and life satisfaction with the sociodemographic variable educational level (Childhood or Primary Degree), given the heterogeneity of the sample of this study and the cross-sectional nature of our data, the results are not conclusive. Nevertheless, taking into account the difference between female and male students of both grades, the data show a greater difference in those of Primary Education Degree. Studies such as that of [34], indicate that the educational level can be a determining factor of greater perceived stress. This fact may also be related to the level of demand required to develop the lessons during the COVID-19 pandemic. On the other hand, the few studies developed in Spain with the university population have shown that the academic environment, the student's own development, the academic performance and the evaluation carried out, can be determining factors for a positive and significant change in the student's levels of stress and satisfaction vital [5]. Thus, the data indicate that, currently, the level of demand before, during and after the COVID-19 pandemic has resulted into high levels of stress among students, especially women [12-13].

Finally, regarding the causal relationship between perceived stress and life satisfaction with the academic performance, the data were analyzed using the Partial Least Squares approach (PLS) and assessed using the convergent validity through the estimation of the Average Variance Extracted (AVE). A partial and moderate fit of the model has been obtained. However, it should be noted that despite the veracity of the data obtained and the simplicity of the proposed model, the sample size and its representativeness do not guarantee that the results can be generalized [35-36]. This fact has led a debate in the literature on structural models that try to ratify this causal relationship. However, the statistical "goodness" of the model is that it is based on simple measurements and that it allows corroborating the initial hypothesis about the fit of the model [37-38]. And, given that it does not requires rigorous parametric assumptions, especially in the distribution of the data, the Partial Least Squares (PLS) modeling does not require the conditions required in traditional models of structural equations with respect to the normality of the data and size of the sample, using nonparametric tests [20, 22, 39].

Thus, the obtained results show the effect of perceived stress on life satisfaction to achieve higher academic performance: on the one hand, perceived stress has a direct

negative relationship on life satisfaction; However, this trend decreases when it is related to academic performance and the perception of improvement in university students. These observations are consistent with what was stated in the study by [9, 39-40]. These researchers indicate that perceived stress could clearly explain the situation experienced by the students during their period of confinement due to the COVID-19 pandemic, since they not only not had to go to class, but also observed that the level of academic demand was lower in relation to the assessment of the subjects taken in previous years. Therefore, the relationship between levels of perceived stress and life satisfaction during the COVID-19 pandemic is not conclusive with the academic results obtained.

Finally, we cannot fail to mention the limitations of this study, among which are: (a) the size of the sample, (b) the greater number of women compared to men and, (c) the limitation of the measurement instruments. This implies that it is necessary to develop further researches with greater heterogeneity in terms of gender, educational level and pre and post pandemic incidence in the academic performance to favor the generalization of the results and conclusions.

The practical implications of this research are relevant to analyze the incidence of perceived stress during the pandemic and de-escalation periods in university students. Specifically, the importance of the findings of this study is that, if replicated, it could serve as a guideline to implement techniques to cope with stress in the university context. The elaboration of instruments and resources should consider the acquisition of personal, emotional and social competences, since these have a greater impact on university student´s life satisfaction and academic performance.

5. Conclusions

This research shows, first, that the perceived stress is negative and significantly related to life satisfaction, but not to academic performance for the Education Sciences students of the University of Jaén. Secondly, no significant differences have been found between the perceived stress and gender, although it is observed that women obtain slightly higher scores in relation to the perceived stress and men, in life satisfaction. In the same vein, the data indicate that, currently, the level of demand before, during and after the COVID-19 pandemic has resulted into high levels of stress among students, especially women.

On the other hand, the obtained results show that the perceived stress has a direct negative relationship on life satisfaction, although this trend decreases when it is related to academic performance and the perception of improvement in university students. Finally, we can conclude that the relationship between levels of perceived stress and life satisfaction during the COVID-19 pandemic is not conclusive with the academic results obtained.

The importance of the results of this study is that, it can be used as a guideline to implement techniques to reduce the level of stress, in future researches on perceived stress, life satisfaction and its relationship with academic performance. The development of intervention programs should emphasize personal, emotional and social skills and competencies, since these have a greater impact on life satisfaction and academic performance.

It is important to note that the results of this research are only applicable to the sample studied and, at most, to the closest population (students from the University of Jaén, from different Andalusian universities and, probably, to the Spanish university

population, in general). This is a cross-sectional study and, the lack of a prior assessment to confinement for COVID-19 of the participants, makes it impossible to determine a causal relationship between the variables. Given that the characteristics of the sample partially limit the conclusions, we think that it is necessary to include a greater heterogeneity in gender, educational level and socioeconomic background of the participants to facilitate the generalization of the results for future research.

Based on the results obtained, we think that it is desirable to continue analyzing the level of perceived stress, life satisfaction and their relationship with academic performance, to evaluate the type of relationship among them and strengthen the scientific evidence in the university context during the de-escalation period, after the COVID-19 pandemic and, thus, be able to implement measures to solve the problem.

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