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Gender-Specific Response to Stress in Master's Adaptation to University in Spain and Russia

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Abstract

Master's students, recognized as one of the most mobile categories of university students, are particularly conscious of their learning process. However, they still undergo an adaptation process to university studies. This study examines the specificities of adaptation to university studies among master's students of different genders in Spain and Russia. The phenomenon of students' adaptation to university life is considered a multi-component process, comprising physiological, sociocultural, socio-psychological, and academic adaptation. Thus, in this research, we examined the gender-specific response to master students' adaptation during the stress of the COVID-19 pandemic. Survey data were collected before and during the lockdown associated with the COVID-19 pandemic. The study involved 226 participants with an average age of 24.3 (56.3% women), from two Russian and two Spanish universities. The research was conducted using the questionnaire 'Assessment of Students' Adaptation to University'. The comparison of adaptation components in Russia and Spain reveals differing results between the countries. Before the pandemic, statistically significant differences in physiological adaptation component values were observed between Russia and Spain ($p < 0.05$). During the pandemic, all components of master students' adaptation processes in both countries changed for both men and women, with the most dramatic changes occurring in women. In Russia, women experienced a statistically significant increase in the academic adaptation component ($p < .05$), while in Spain, there was a statistically significant decline in sociocultural adaptation ($p < .01$). It is concluded that women in both countries are most susceptible to stress related to the COVID-19 pandemic. Previous studies have indicated that stress affects men and women differently, and our study contributes to this body of research by providing insight into the gender-specific response to stress in master's adaptation to university.

Keywords: *Adaptation, higher education, lockdown, stress, gender-specific differences.*

Introduction

Master's students constitute one of the most mobile student categories. Despite their prior university experience, they frequently encounter the need to adapt to new educational environments when transitioning to different universities or faculties. Moreover, master's students are focused on their professional advancement, with many already juggling studies alongside

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employment. Given their limited study time, they may encounter challenges in managing the adaptation process.

The adaptation process is commonly understood as a behavioural pattern affected by the interplay of psychophysiological and sociopsychological factors (Morozov et al., 2017; Rean, 2006). In an international context, cross-cultural adaptation theory explains adaptation as the dynamic interaction between an individual and an unfamiliar environment (Kim, 2000). Deniz & Yilmaz (2005) enumerate several elements that hinder students' adaptation to university life: disparities in national educational systems, variations in incentives across specific institutions, distinctions in regional or national traditions and languages, climatic conditions, the student's age, level of maturity, and academic independence, as well as challenges related to housing and friendships during the study period. In light of these theories, this study views students' adaptation to university life as a multi-component and complex process encompassing physiological, sociocultural, sociopsychological, and academic adaptation (Nugmanova et al., 2021; Baker, & Siryk, 1989). Each of these components holds distinct significance and influence in the adaptation process, with indicators of these components serving as measures of adaptation success.

This study is conducted in Spain and Russia. In Spain, the issue of student adaptation to university life has been investigated by Gazo et al. (2018) and Manso-Ayuso & Martín (2014). In Russia, Sedankina (2022) addressed the adaptation of master's students. Significant differences exist between the Russian and Spanish educational systems in terms of training methods, approaches, and organizational aspects, including document submission, training schedules, approved curriculum, assessment systems, and even the duration of the master’s program, typically two years in Russia and one in Spain (Kozlova et al., 2017). To the best of our knowledge, no comparative studies have been conducted on the adaptation process of master's students between Russia and Spain.

The COVID-19 pandemic has introduced unique challenges to university adaptation. Pérez-López et al. (2021) examined shifts in student adaptation to learning during the pandemic. Vasileva et al. (2021) and Makaricheva & Burguvan (2022) explored the psychological adaptation of Russian students amidst the pandemic, while Oleynik et al. (2020) investigated adaptation to new learning environments during COVID-19. The pandemic has precipitated social and academic transformations in students' lives (Nugmanova et al., 2022b). With many countries forced to shutter educational institutions due to the rapid spread of COVID-19, nearly 70% of the world's

student population was affected (UNESCO, 2020). Master's students started their studies in an educational landscape swiftly evolving due to the epidemiological situation, intensifying the urgency of the adaptation challenge. Studies indicate that quarantine lasting more than nine days can induce stress (Sandín et al., 2020; Wang et al., 2011). According to Sorokin et al. (2020), essential anti-epidemic measures such as self-isolation and social distancing, mandated during the COVID-19 pandemic, can serve as independent stressors. This aligns with findings suggesting that individuals not directly affected by the infection can still experience the acute effects of social restrictions (Lei et al., 2020). Scholars proposing various stress models contend that stress alters an individual's adaptive capacities, thereby necessitating changes in the body's resources (Dallman, 2007; Korte, 2005; Kupriyanov & Zhdanov, 2014; Selye, 1976). Hence, it is reasonable to assume that factors such as the threat of illness, the implementation of epidemiological measures, their duration and intensity, and alterations in educational formats influenced the adaptation of master's students. These additional, non-standard adaptive responses may vary depending on the intensity of the impact (Garkavi et al., 1979) and may also differ between male and female populations (Sapolsky, 2017), prompting us to incorporate a gender perspective into our study.

Changing your usual lifestyle due to entering university can cause stress for students. Stress factors in student life were studied by Gadzella (1994). A study by Credé and Niehorster (2012) associated affective states in students such as depression, stress and loneliness with the level of students' adaptation to university. The processes of student integration into the social and academic environment and the factors influencing adaptation have been described by such authors (Mattanah, et al., 2004; Okunishi & Tanaka, 2023; Tinto, 1996). A study by Clinciu (2013) aimed at studying the relationship between the level of adaptation to university and stress showed that the greatest negative correlation between stress and adaptation to university life was also noted for the emotional-affective component. Evidence of gender differences in the process of adjustment to university comes from studies (Wintre & Yaffe, 2000; Gadzella & Carvalho, 2006; Enochs & Roland, 2006).

Gender differences in stress responses are extensively documented in the scientific literature (Boyd et al., 2015; Sapolsky, 2017; Seedat et al., 2009). Studies conducted during the pandemic shows gender disparities in stress responses amid the COVID-19 outbreak; for instance, women tend to experience higher levels of stress, impacting sleep patterns, mood, and coping strategies (García-Fernández et al., 2021; Kolakowsky-Hayner et al., 2021). Gender variations in coping strategies

and their association with anxiety symptoms during the initial isolation period of COVID-19 have been observed (Cholankeril et al., 2023; Ulloa et al., 2022). Despite considerable scientific interest in investigating gender-specific responses to stress, there is a scarcity of comparative studies on student adaptation in different countries before and after the COVID-19 pandemic, while considering gender, within scientific literature.

The epidemiological situation evolved disparately over the course of two years in Spain and Russia, yet both governments implemented epidemiological measures directly impacting students. In Spain, stringent lockdown measures were enforced to safeguard public health and prevent virus transmission (Aloi et al., 2020). In March 2020, amidst a wide range of measures, the closure of all educational institutions was implemented, with university students transitioning to distance and blended learning formats (Giannini, 2020; Zubillaga & Gortazar, 2020). Subsequently, between the second and third waves, additional measures were introduced, including limitations on public and private gatherings, enforcement of self-protection measures, closure of cafes and restaurants, and restrictions on inter-regional mobility (Cuéllar Rivero & Mateos, 2021). Considering the corresponding measures in Russia, it's noteworthy that Russia entered the COVID-19 period later than Spain, allowing for established protocols and avoiding the implementation of similarly severe restrictive measures as seen in Spain.

Russia primarily implemented restrictions related to public life during the pandemic. A brief period of self-isolation was introduced during the initial phase of the pandemic, followed by measures limiting the size of public and private gatherings and issuing recommendations regarding self-protection measures. In March, universities were advised to transition to distance education, and after a one-week recess, in April 2020, the Russian Ministry of Science and Higher Education mandated distance learning from April 2020 to February 2021, leading to a 95% adoption rate among Russian students (Yarmak et al., 2021). In summary, Russian master's students anticipated stricter quarantine measures compared to those ultimately implemented, especially when compared to their Spanish counterparts. Nonetheless, both countries' higher education systems adopted similar teaching solutions.

Indeed, transitioning to different education formats requires additional effort from students (Cabrera, 2020), and online learning poses challenges in assimilating new information, particularly in practical classes (Bogdan & Bekur, 2020), (Magadieva, 2016). Given that both countries experienced emergency distance education online during the COVID-19 pandemic, studying

changes in the adaptation components of master's students before and during the pandemic becomes feasible. We suggest that our comparative study could offer a more comprehensive understanding of university adaptation challenges compared to single-country studies. Although, such factor as the influence of gender on stress was considered by Biwer et al. (2021) and Xhelili, et al. (2021), as well as changes in different countries, were considered by Ruiz-Robledillo, et al. (2022). However, our study tests each of the parameters separately, allowing us to eliminate the hidden influence of variables and conduct a more detailed study. Understanding how stress associated with the pandemic affects the adaptation process will allow us to manage this process and reduce the risks of maladaptation in the student environment.

The aim of the study is to investigate the influence of environmental and cultural factors on the adaptation of students of different genders to university life in Russia and Spain.

Research Questions

The research questions of the study are outlined as follows:

Q1: Are there differences in students' adaptation to university across countries?

Q2: How has the pandemic affected students' adaptation to university across countries?

Q3: Are there gender differences in response to pandemic stress in the adaptation of master's students to university in Spain and Russia?

Method

Research Design

Our initial study design can be considered cross-sectional as it recorded observations in a selected group at a single point in time and essentially comparative. It was perceived with two main independent variables: country and gender. However, just after the data in the four universities was collected (see Stage 1 below), a drastic change in circumstances occurred and a new stress factor appeared which motivated us to extend our research adding COVID pandemic as an additional variable (Stage 2). As this extension was not intentional, our research is to be considered non-experimental (Kerlinger, 1986; Thompson et al., 2007) and continued being essentially comparative **(**Figure 1).

Participants engaged by completing the 'Assessing Student Adaptation to University' questionnaire (Kupriyanov & Nugmanova, 2019). The variables under investigation encompassed the adaptation components of students from various countries, genders, and the impact of the COVID-19 pandemic.

The research design comprised three stages:

Stage 1: Conducted in Russia and Spain from 2018 to 2019, this stage involved studying students' adaptation to university before the COVID-19 pandemic. Respondents completed the questionnaire either in a paper format or online.

Stage 2: Conducted from 2020 to 2021, amidst the COVID-19 pandemic, this stage involved collecting online responses only in Russia and Spain. Respondents meeting the study criteria received a link through the Google Forms. Participation in the study was voluntary and anonymous.

Stage 3: Entailed statistical analysis of the survey results using STATISTICA software.

The study adhered to the principles outlined in the Declaration of Helsinki and obtained approval from the ethics committees of Kazan Federal University (Russia) and the University of Miguel Hernandez (Spain).

Our hypotheses are as follows:

H1: There are differences in students' adaptation to university in different countries.

H2: The pandemic COVID-19 has significantly affected all aspects of master's adaptation to university life, with notable differences between Spain and Russia.

H3: The gender-specific response to stress caused by the pandemic when master students were adapting to university was different.

This leads to the following research objectives:

1. To compare the components of students' adaptation to university in Spain and Russia.
2. To examine the impact of the pandemic on various components of the adaptation process in Russia and Spain.
3. To examine how the pandemic has affected the adaptation components of male and female students in both Russia and Spain.

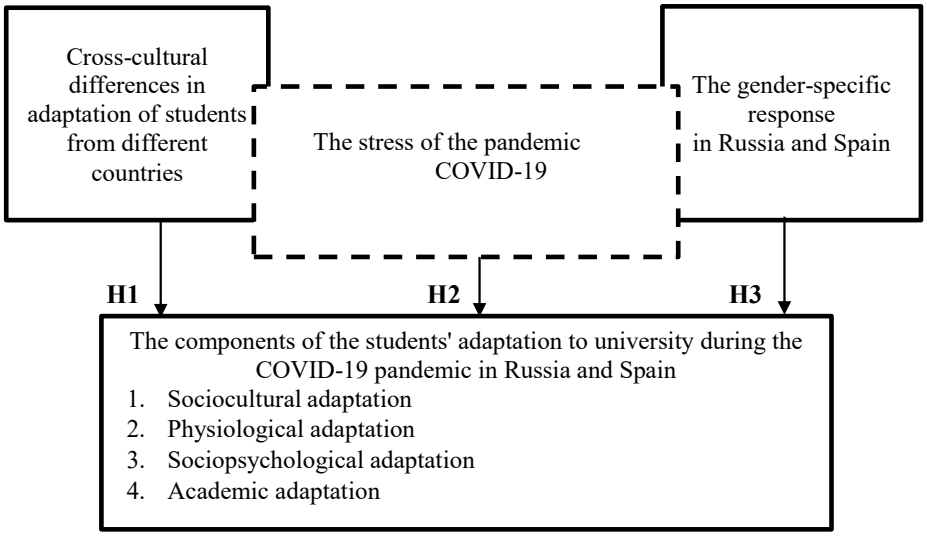

Figure 1. Hypothesis testing Flow

Participants

The study involved 226 participants, with an average age of 24.3 years, drawn from two universities in Russia and two in Spain. Table 1 provides further detailed information regarding the participants. All students were from public universities and had the same socio-economic level.

Table 1.
Participants

Master's students	Total	Russia	Spain
All participants	226	128	98
Participants before COVID-19	95	48	47
Participants during COVID-19	131	80	51
Average age	24.3	23.8	24.9
All women (%)	56.3	49.4	63.2
Women before COVID-19 (**%**)	49.6	37.5	61.7
Women during COVID-19 (**%**)	63	61.3	64.7

Data Collection Tools

The research on adaptation before and during the COVID-19 era utilized the 'Assessment of Students' Adaptation to University' questionnaire (Kupriyanov & Nugmanova, 2019). This

questionnaire comprises 25 questions, assessed on a 7-point Likert scale. The questions are organized into four subscales, evaluating various aspects of students' adaptation to university life: 'sociocultural adaptation', 'physiological adaptation', 'sociopsychological adaptation', and 'academic adaptation'.

Sociocultural adaptation. This concept pertains to the adaptation to a new cultural environment, namely the state of harmony and well-being within this environment (Hirai et al., 2015; Searle & Ward, 1990; Slobodchikov & Isayev, 1996; Ward & Kennedy, 1999; Ward & Rana-Deuba, 1999). The scale of sociocultural adaptation is delineated by factors such as students' familiarity with the social and cultural life of their university, their engagement with the social and cultural milieu of the city of study, as well as their interest in local history and culture (Gannon & Poon, 1997; Gladush et al., 2008). In (1) we can see an example of a question on sociocultural adaptation.

(1) Rate how active you are outside of the university curriculum (music, sports, dancing, socializing).

Physiological adaptation. Physiological adaptation encompasses the human body's response to environmental changes, including the transition to university, which can be a source of strain and acute stress (Friedlander, 2007; Gall, Evans, & Bellerose, 2000). Characteristics indicative of physiological adaptation, as outlined by Arsenyev (2003), encompass life balance, overall activity level, and the balance among functional systems, organs, and tissues of the body, along with mechanisms regulating bodily functions to ensure normal functioning throughout the academic year. The scale of physiological adaptation evaluates several factors, including the student's self-assessment of health and physical well-being since commencing the master's program, the balance between study and rest, adequate sleep and nutrition, as well as the comfort of classrooms and equipment (Chemers et al., 2001). In (2) we can see an example of a question on physiological adaptation.

(2) Rate how well you sleep during the term.

Sociopsychological adaptation comprises two interrelated components: social adaptation, which involves students' acceptance and assimilation of the values and norms within their educational environment at the university, and psychological adaptation, which pertains to the psychological state of the student while studying at the university, including their ability to cope with academic workload and stress during exams (Berno & Ward, 1998; Friedlander, 2007; Ward & Kennedy, 1994). The scale of sociopsychological adaptation assesses various aspects, including the student's

emotional well-being, their interest in peers, emotional comfort in social settings, participation in group activities, peer support, the psychological atmosphere within the student community, and the extent of social interactions at the university (Osnitskiy, 2004; Pilugina & Taranenko, 2016). In (3) we can see an example of a question on socio-psychological adaptation.

(3) Evaluate your general emotional state since the beginning of your university studies.

Academic adaptation refers to an individual's capacity to adjust to studying at a selected university. It encompasses the ability to acquire knowledge, develop skills and competencies, engage with the university testing system, as well as employ effective self-study methods and organize one's educational process efficiently (Baeva & Gayazova, 2021; Baker & Siryk, 1989; Jardim, 2023; Tanaka et al., 1994). The scale of academic adaptation evaluates various factors, including students' motivation for learning, their aptitude for mastering the curriculum, time management abilities, presentation skills, comprehension of educational texts, and readiness for professional development (Kozlova, 2010; Nugmanova et al., 2022a). In (4) we can see an example of a question on academic adaptation.

(4) Evaluate your ability to read and understand academic literature.

A more comprehensive description of each questionnaire scale, along with sample questions, can be found in the prior study (Nugmanova et al., 2022b). In the work from 2019 by Kupriyanov and Nugmanova provided information on the reliability of the questionnaire “Assessment of students’ adaptation to university”, the internal consistency of Cronbach’s alpha for subscales for 245 subjects was: sociocultural adaptation - 0.76, physiological adaptation - 0.73, socio-psychological adaptation - 0.83, academic adaptation - 0.72 (Kupriyanov & Nugmanova, 2019). The utilization of the questionnaire, validity assessment, and reliability are detailed in following studies (Kupriyanov & Nugmanova, 2019), (Nugmanova & Kupriyanov, 2020), (Nugmanova et al., 2021), and (Nugmanova et al., 2022a).

Data Collection

The study occurred at the two universities from each country. During the 2020/21 academic year, amid the SARS-CoV-2 (COVID-19) pandemic, we interviewed 80 first-year master’s students in Russia, from Kazan National Research Technological University and Kazan Federal University. Similarly, in Spain, we interviewed 51 master's students from the Autonomous University of Barcelona and Miguel Hernandez University. All selected universities were public institutions,

and the students participating in the survey studied humanities. This selection rationale aligns with prior findings that indicated differences in adaptation between humanities and engineering students (Nugmanova et al., 2021). Additionally, data collected during the COVID-19 pandemic were supplemented by analogous information gathered before the pandemic during the 2018/2019 academic year, from the same universities and faculties, involving 48 master's students in Russia and 47 in Spain.

Data Analysis

The data analysis utilized the STATISTICA-12 statistical package. Analysis of the normal distribution revealed that not all samples followed a normal distribution (according to the Shapiro-Wilk normality test), rendering the use of a t-test inappropriate for data analysis (Table 2). Table 2 contains the analysis of the test of normality Shapiro-Wilk for groups Russia and Spain, groups of men and women, students before and during the pandemic COVID-19. Consequently, non-parametric statistical methods were employed. The comparison of samples before and during the COVID-19 pandemic was conducted using the Kolmogorov-Smirnov method, while gender differences were assessed using the Mann-Whitney test (U-test). These methodological choices were made to address the requirements of the first and second hypotheses.

The Kolmogorov-Smirnov test is employed to compare two independent samples, with a minimum sample size of 25, and its accuracy increases with larger sample sizes (Ermolaev, 2003). Therefore, we utilize it to confirm hypothesis 1and 2. The use of the Mann-Whitney method (U-test) is justified by its status as a nonparametric counterpart to the t-test, particularly effective for small sample sizes (Sidorenko, 2003). Consequently, we employ it to confirm hypothesis 3, given the small sample size in this scenario.

Table 2

Description of the test of normality Shapiro-Wilk

Groups		Adaptation component			
		Sociocultural	Physiological	Sociopsychological	Academic
students in Russia, n = 128	W	.9841	.9708	.9759	.9848
	p-value	.29	.03*	.07	.98
students in Spain,	W	.9802	.9836	.9768	.9841

n = 98	p-value	.06	.13	.03*	.14
female students	W	.9781	.9792	.9832	.9855
n = 129	p-value	.03*	.045*	.11	.19
male students	W	.9839	.9750	.9733	.9861
n = 97	p-value	.28	.06	.045*	.40
before the COVID-19	W	.9786	.9863	.9767	.9879
pandemic n = 95	p-value	.12	.43	.09	.54
during the COVID-19	W	.9857	.9736	.9751	.9844
pandemic n = 131	p-value	.19	.01*	.02*	.14

*Note. * - the group doesn´t have a normal distribution in the tested variable, p <.05*

Descriptive statistics

Table 3 presents the means and standard deviations (SD) of the sample's performance on the measures.

Table 3

Means, standard deviations of the structural components of adaptation

		Sociocultural		Physiological		Sociopsychological		Academic	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD
in Russia	before the COVID-19	4.95	.99	4.57	.87	4.44	.86	4.29	.68
	during the COVID-19	4.97	1.23	4.95	1.18	4.55	.94	4.56	.94
in Spain	before the COVID-19	5.19	.99	5.09	1.16	4.58	.77	4.60	.70
	during the COVID-19	4.57	.85	5.11	.97	4.55	.88	4.52	.64

Note. SD = Standard Deviation

Hypotheses Testing

Testing hypothesis H1.

Cross-cultural differences in adaptation of students before the COVID-19 pandemic in Russia and Spain

The analysis of the structural components of adaptation (Table 4) reveals that in both countries, the sociocultural component received the highest rating (5.19 in Spain and 4.95 in Russia), followed by the physiological component (5.09 and 4.57, respectively). However, differences between the two countries emerge concerning the sociopsychological and academic components of adaptation. In Russia, the academic component exhibits the lowest level (4.29), while in Spain, it is the sociopsychological component (4.58). Comparing the adaptation levels in Russia and Spain indicates that students in Spain generally rate all adaptation components higher than their counterparts in Russia. However, statistically significant differences ($p < .05$) between the countries were observed only in the physiological component of adaptation, with Spain (5.09) surpassing Russia (4.57). Hypothesis H1 was confirmed.

Table 4

Levels of adaptation to university studies in countries before the COVID-19 pandemic

Adaptation component	in Russia, n = 48			in Spain, n = 47			p-value, Kolmogorov–Smirnov
	Mean	Mean Rank	Rank Sum	Mean	Mean Rank	Rank Sum	
Sociocultural	4.95	46.25	2172	5.19	50.81	2388	> .10
Physiological	4.57	41.52	1993	5.09	54.62	2567	< .05*
Sociopsychological	4.44	46.77	2245	4.58	49.28	2316	> .10
Academic	4.29	43.35	2081	4.60	52.74	2479	> .10

Note. * *- statistically significant differences* $p < .05$

Testing hypothesis H2.

The influence of the pandemic on the components of the adaptation process in Russia

In Russia (Table 5), statistically significant changes occurred in the academic adaptation component during the pandemic ($p < .05$). Comparing the average values of this component before and during the COVID-19 period reveals an improvement from 4.29 before to 4.56 during the pandemic. While Table 5 also shows higher mean values for all components during the pandemic than before, changes in the other indicators are not statistically significant. However, Figure 2 shows a wider range of values for sociocultural, physiological, and academic adaptation

components. This suggests that although some students appeared to adapt well to the situation, many encountered difficulties as well. Part of hypothesis H2 about the impact of the pandemic on adaptation in Russia was confirmed.

Table 5

Comparison of the mean values of adaptation components before and during the COVID-19 pandemic in Russia

Adaptation component	before the COVID-19 pandemic, n=48			during the COVID-19 pandemic, n=80			p-value, Kolmogorov–Smirnov
	Mean	Mean Rank	Rank Sum	Mean	Mean Rank	Rank Sum	
Sociocultural	4.95	63.85	3065	4.97	64.89	5191	> .10
Physiological	4.57	56.48	2711	4.95	69.33	5546	< .10
Sociopsychological	4.44	61.77	2965	4.55	66.15	5292	> .10
Academic	4.29	57.56	2763	4.56	68.68	5494	< .05*

*Note. * - statistically significant differences p* <.05

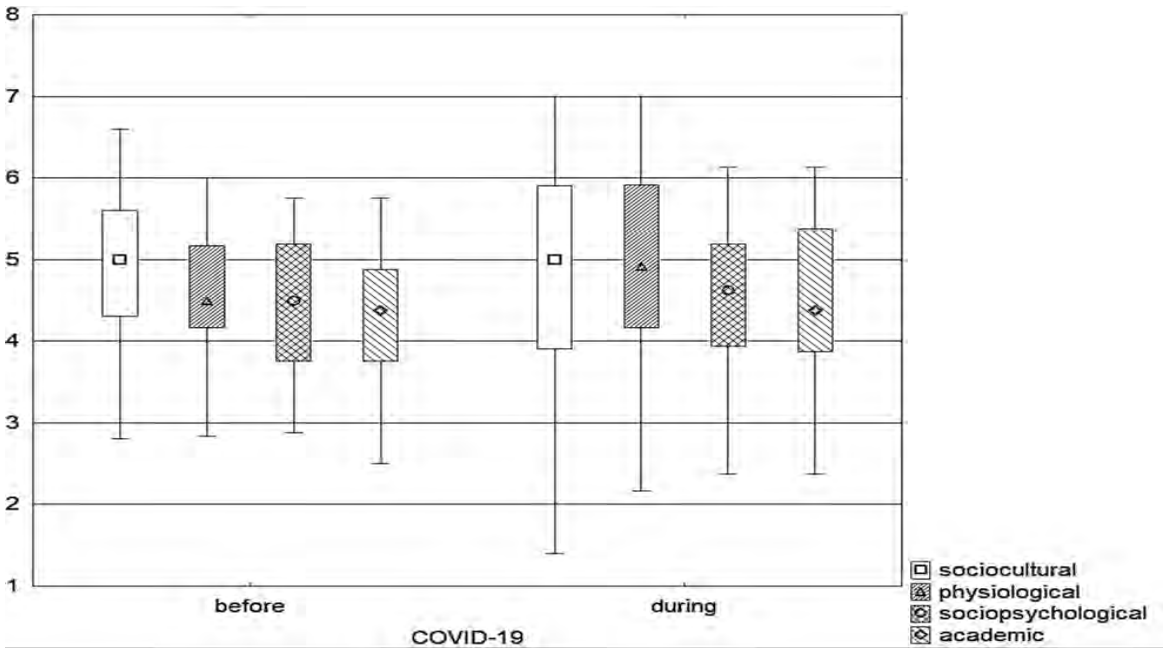

Figure 2. Distribution of values of adaptation components before the COVID-19 pandemic compared to values of the same adaptation components during the pandemic in Russia (median, box: 25%–75%)

The effect of the pandemic on the components of the adaptation process in Spain

As depicted in Table 6, significant changes ($p < .05$) in the sociocultural component of adaptation were observed in Spain during the pandemic. The value of this sociocultural component decreased from 5.19 before the pandemic to 4.57 during the pandemic. Spain was among the first countries to confront the impacts of the pandemic, prompting the implementation of stringent measures to safeguard the population and mitigate the spread of the virus. Part of hypothesis H2 about the impact of the pandemic on adaptation in Spain was confirmed.

Table 6

Comparison of the mean values of adaptation components before and during the COVID-19 pandemic in Spain

Adaptation component	before the COVID-19 pandemic, n=47			during the COVID-19 pandemic, n=51			p-value, Kolmogorov–Smirnov
	Mean	Mean Rank	Rank Sum	Mean	Mean Rank	Rank Sum	
Sociocultural	5.19	58.40	2745	4.57	41.29	2106	< .05*
Physiological	5.09	49.57	2330	5.11	49.45	2522	> .10
Sociopsychological	4.58	48.79	2293	4.55	50.16	2558	> .10
Academic	4.60	50.72	2384	4.52	48.39	2468	> .10

Note. * - *statistically significant differences p* <.05

The distribution of adaptation component values before and during the pandemic (Figure 3) shows that the sociopsychological component of adaptation during the pandemic exhibits a broader range of values compared to before the pandemic. Furthermore, the distribution of average scores for the academic adaptation component also demonstrates significant fluctuation during the pandemic, trending towards deterioration. The wide range of average values suggests the presence of students demonstrating good performance in both the academic and sociopsychological components of adaptation, alongside those exhibiting notably poorer values for these components.

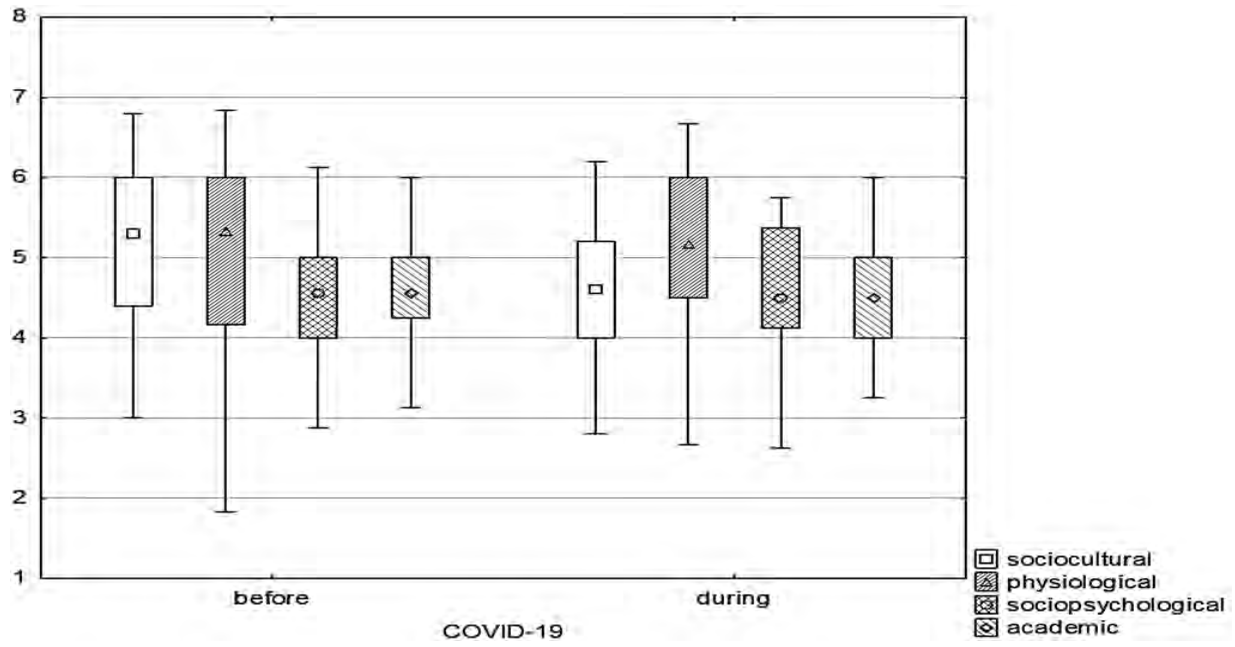

Figure 3. Distribution of values of adaptation components during the COVID-19 pandemic compared to values of the same adaptation components before the pandemic in Spain (median, box: 25%–75%)

Comparison of the components of the adaptation process during the COVID-19 pandemic in Russia and Spain

A comparison of the adaptation process components during the COVID-19 pandemic in Russia and Spain (Table 7) shows statistically significant differences ($p < .05$) in sociocultural adaptation. The average value of the sociocultural adaptation component (4.57) in Spain during the pandemic is lower than the average value of sociocultural adaptation (4.97) in Russia during the pandemic. However, the physiological component of adaptation in the Spanish sample, overall, exhibit higher values during the pandemic. The last part of the Hypothesis H2 on the differences in student adaptation during the pandemic COVID-19 in Spain and Russia was confirmed. Thus, we confirm hypothesis H2.

Table 7

Levels of adaptation to university studies in different countries during the COVID-19 pandemic

Adaptation component	in Russia, n = 80			in Spain, n = 51			p-value, Kolmogorov–Smirnov
	Mean	Mean Rank	Rank Sum	Mean	Mean Rank	Rank Sum	

Sociocultural	4.97	71.61	5729	4.57	57.22	2918	< .025*
Physiological	4.95	64.10	5128	5.11	68.98	3518	> .10
Sociopsychological	4.55	65.85	5268	4.55	66.24	3378	> .10
Academic	4.56	66.99	5359	4.52	64.45	3287	> .10

Note. * - *statistically significant differences p* <.05

Testing hypothesis H3.

Impact of the pandemic on the adaptation components of male and female students in Russia

The comparison of the impact of the COVID-19 pandemic on the components of university adaptation for men and women in Russia is presented in Tables 8 and 9. The analysis of the tables reveals differing reactions to the pandemic between men and women. Specifically, for men, there is an increase in the values of sociocultural and physiological adaptation, accompanied by a decrease in sociopsychological and academic adaptation. Conversely, for women, there is a decrease in the value of sociocultural adaptation, while the values of the remaining components increase. Statistically significant differences ($p < .05$) were observed in academic adaptation for women before the pandemic (4.24) compared to during the pandemic (4.75). However, for men, no statistically significant differences were found when comparing the indicators before and during the COVID-19 pandemic (Table 8). Thus, part of hypothesis H3 about the difference in gender reactions to pandemic stress during the adaptation period of master's students to a university in Russia was confirmed.

Table 8

Evaluation of university adaptation components by female students in Russia before and during the COVID-19 pandemic

Adaptation component	Before the pandemic, *n* = 18			During the pandemic, *n* = 49			*U*	*p-value*, Mann–Whitney *U*
	Mean	Mean Rank	Rank Sum	Mean	Mean Rank	Rank Sum		
Sociocultural	5.18	36.05	649	5.03	33.27	1630	405	.61
Physiological	4.50	29.17	525	4.91	35.78	1753	354	.22
Sociopsychological	4.38	30.28	545	4.63	35.37	1733	374	.34
Academic	4.24	25.83	465	4.75	37.02	1814	294	.03*

Note. * - *statistically significant differences p* <.05

This suggests that women primarily contribute to the statistically significant change in the average

values of the academic adaptation component before and during the COVID-19 pandemic in Russia.

Table 9

Evaluation of university adaptation components by male students in Russia before and during the COVID-19 pandemic

Adaptation component	Before the pandemic, $n = 30$			During the pandemic, $n = 31$			*U*	*p-value*, Mann–Whitney *U*
	Mean	Mean Rank	Rank Sum	Mean	Mean Rank	Rank Sum		
Sociocultural	4.82	29.87	896	4.89	32.13	996	431	.62
Physiological	4.61	27.27	818	5.00	35.77	1073	353	.11
Sociopsychological	4.48	31.63	949	4.43	30.42	943	447	.79
Academic	4.33	32.10	963	4.25	29.94	928	432	.63

Note. * *- statistically significant differences p* <.05

Impact of the pandemic on the adaptation components of male and female students in Spain

Tables 10 and 11 present the changes in the components of university adaptation for men and women in Spain. Comparing the changes in the values of the structural components of adaptation between men and women reveals the unique responses to the pandemic exhibited by individuals of different genders. Specifically, for women, there is a decrease in sociocultural and academic adaptation, accompanied by an increase in sociopsychological adaptation. Conversely, for men, there is an increase in physiological and academic adaptation, while sociocultural and sociopsychological adaptation decrease.

In Spain, statistically significant changes in the components of adaptation were observed only for women, similar to the findings in Russia. The most significant changes during the pandemic were observed in the sociocultural adaptation component, which decreased from 5.22 to 4.53; these changes were statistically significant ($p < .05$). Conversely, for men, changes in academic adaptation during the pandemic were less pronounced compared to women, and no statistically significant changes were observed. This observation aligns with the trend observed among students in Russia, where the most significant changes were also found among women. It can be inferred that women are experiencing the stress associated with the COVID-19 pandemic more intensely. The last part of hypothesis H3 about the difference in gender reactions to pandemic stress during

the adaptation period of master's students to a university in Spain was confirmed.

Table 10

Evaluation of university adaptation components by female students in Spain before and during the COVID-19 pandemic

Adaptation component	Before the pandemic, $n = 29$			During the pandemic, $n = 33$			*U*	*p-value*, Mann–Whitney *U*
	Mean	Mean Rank	Rank Sum	Mean	Mean Rank	Rank Sum		
Sociocultural	5.22	37.56	1098	4.53	25.94	856	295	.01*
Physiological	5.13	32.17	933	5.13	30.90	1020	459	.79
Sociopsychological	4.58	30.31	879	4.63	32.58	1075	444	.63
Academic	4.65	34.03	987	4.48	29.27	966	405	.30

Note. * - *statistically significant differences* $p < .05$

Table 11

Evaluation of university adaptation components by male students in Spain before and during the COVID-19 pandemic

Adaptation component	Before the pandemic, $n = 18$			During the pandemic, $n = 18$			*U*	*p-value*, Mann–Whitney *U*
	Mean	Mean Rank	Rank Sum	Mean	Mean Rank	Rank Sum		
Sociocultural	5.09	20.44	368	4.63	16.56	298	127	.28
Physiological	4.98	18.11	326	5.08	18.89	340	155	.84
Sociopsychological	4.61	19.17	345	4.41	17.83	321	150	.72
Academic	4.46	17.17	309	4.59	19.83	357	138	.46

Note. * - *statistically significant differences* $p < .05$

This suggests that the statistically significant change in the average values of the academic adaptation component can primarily be attributed to women. These changes in students' adaptation can be explained by women's more pronounced response to the stress caused by the COVID-19 pandemic. Additionally, general patterns emerge among the Spanish and Russian samples: men responded to the pandemic with an increase in physiological adaptation and a decrease in sociopsychological adaptation, while women exhibited a decrease in sociocultural adaptation and an increase in sociopsychological adaptation. Thus, we confirm hypothesis H3.

Discussion

The aim of this study is to test three hypotheses: that there are differences in the adaptation process from across countries, that COVID-19 has significantly affected all aspects of master's adaptation to university and that the gender-specific response to pandemic stress was different. The hypotheses were supported by statistical data.

Cross-cultural differences in the adaptation of students from different countries

The study results obtained from comparing the average values of the adaptation components in Russia and Spain before the pandemic reveal a significant difference in the physiological adaptation component, with higher average values observed in Spain. This variance can be attributed to climatic conditions. Spain typically experiences much better weather conditions during the school year compared to the average climate in Russia. Interestingly, this disparity disappears when comparing the adaptation components of both countries during the pandemic, when online learning was first introduced, followed by a mixed format. This observation is further supported by our surveys of international students in Russia, who ranked Russia's climate in second place before the pandemic. During the pandemic, they moved it to fifth place and demonstrated favourable values of the physiological adaptation component (Nugmanova et al., 2022b). The intercultural differences and the difficulty of adaptation of international students have been pointed out by authors such as Berry (1997) and Poyrazli et al. (2002). Unfortunately, there are very few studies comparing the adaptation process of students in different countries. But if international students experience difficulties and culture shock, then there is a difference in the processes of adaptation to the university between countries (Lee & Bradley, 2005; Ward et al., 2001). This is consistent with our results supporting hypothesis H1.

The pandemic's impact on the adaptation of students in Spain and Russia

Comparing the components of the adaptation process during the COVID-19 pandemic in Russia and Spain, we find statistically significant differences in sociocultural adaptation. This can be attributed to the distinct social and epidemiological situations in the two countries. A comparison of the dynamics of change in the adaptation components in the two countries during the pandemic reveals divergent patterns. The varied changes in students' adaptation during COVID-19 across different countries are highlighted in studies such as Biwer et al. (2021) and Xhelili et al. (2021). In the box-and-whiskers diagram (Figure 2), we observe the distribution of adaptation component values before and during the COVID-19 pandemic in Russia. The study group exhibits increasing

heterogeneity in physiological and sociocultural adaptation components, indicating that the pandemic affects each student's physical condition and sociocultural life to varying degrees. The high assessment of academic adaptation by Russian students can be interpreted as their response to the stressful situation caused by the COVID-19 pandemic and changes in the educational format. Garkavi et al. (1979) identify several adaptive responses to stressful situations, including negative 'stress' and positive 'training' and 'activation'. The latter two types have stimulating effects and promote successful adaptation. The intensity of the stimulus determines the reaction: excessive force leads to stress and often maladaptation, while an average level prompts an activation reaction, and a low level induces a training reaction (Kupriyanov, 2014a, 2014b). Perhaps Russia's delayed entry into the pandemic, coupled with greater certainty of the situation (due to developed and tested treatment protocols and anti-epidemic measures in other countries), along with the presence of various forms of online learning already used in Russian universities before the pandemic (Klyagin et al., 2020), mitigated the impact and led to the emergence of an 'activation reaction' among Russian students. Thus, the pandemic did not result in decreased adaptation rates but rather stimulated the process of adaptation to university life.

In Spain, statistically significant changes in the sociocultural component of adaptation were observed during the pandemic. Spain was among the first countries to confront the repercussions of the pandemic, and stringent public safety measures impacted students' social lives (Cuéllar Rivero & Mateos, 2021). Prolonged lack of personal contact resulted in a decrease in the average value on the sociocultural adaptation scale. The distribution of adaptation component values before and during the pandemic reveals a wider spread of values for the sociopsychological component during the pandemic, with indicators of academic adaptation showing a broader spread towards deterioration. The pandemic's impact on the adaptation of Spanish students differs from its impact on Russian students. Lower values of adaptive components during the pandemic compared to before suggest the presence of a more negative adaptive reaction known as 'distress' (Le Fevre et al., 2003; Nelson & Simmons, 2003). Thus, we confirm our second hypothesis H2 that the pandemic affected every adaptation component part of the process of adaptation of master's students to university, and this process varied between Spain and Russia.

The gender-specific response to stress caused by the pandemic

Our study highlights a more significant change in the average values of the academic adaptation component during the COVID-19 pandemic in Russia, particularly noticeable among women

compared to men. Similarly, in Spain, a similar trend is observed in the sociocultural component of adaptation. This divergence can be attributed to women's heightened response to stress, consistent with findings by Zhdanov et al. (2020), who examined stress responses between genders, and García-Fernández et al. (2021), Marelli et al. (2021), Corrigan (2024) who documented a more pronounced impact of the pandemic on women.

A comparison of adaptation component changes in Russia and Spain reveals distinct patterns in each country. In Spain, the master's adaptation process demonstrates higher average adaptation values, particularly evident in the physiological adaptation component. Analysing the pandemic's impact on each country separately, we observe improvements in all adaptation components in Russia, with the physiological component notably enhanced. Conversely, in Spain, while the physiological component showed slight improvement, the other components experienced deterioration, especially the sociocultural adaptation component. The COVID-19 pandemic affected all adaptation components for master's students in both Spain and Russia, affecting both genders. Nonetheless, women exhibited a more pronounced response to stress and were primarily responsible for these observed changes. We have successfully validated the third hypothesis H3 of our research, indicating a gender-specific response to stress caused by the pandemic during master students' adaptation to university life.

Conclusion

The findings of this study hold practical implications that extend beyond the specific context examined. This study highlights differences in the characteristics of students' adaptation across countries, with the strongest differences observed in sociocultural and physiological adaptation. The stress caused by the COVID-19 pandemic affected all components of adaptation, with a particularly strong impact on the academic component in Russia and the sociocultural component in Spain. The results of the study shed light on gender-specific responses to pandemic stress. Common patterns were identified in the Spanish and Russian samples: men responded to the pandemic with increased physiological adaptation and decreased sociopsychological adaptation, while women showed a decrease in sociocultural adaptation and an increase in sociopsychological adaptation.

Limitations, implications, and future directions

The present study possesses both strengths and limitations. One strength lies in its survey methodology, yet this approach may introduce biases given its reliance on self-reflection and self-assessment. Such subjective assessments are influenced by various factors, including the respondent's mental and physical state. Although a sizable sample size often mitigates individual differences, the general sociopsychological context of society during a pandemic could potentially impact the accuracy of this technique. Another limitation is that our study does not take into account the individual psychological characteristics of the student, which can have a significant impact on the adaptation process.

The observed changes in student adaptation before and during the pandemic highlight the importance for universities to implement tailored measures to stabilize the adaptation process. In Spain, where students were significantly impacted by the lockdown measures, additional efforts were required to aid students in adapting to these challenging circumstances. This included supporting students in developing their autonomy, maintaining motivation, and assisting in organising and planning their academic activities. For Russia, where there is an increasing heterogeneity of physiological and sociocultural components of adaptation in a pandemic, it is possible to propose monitoring the level of adaptation of students in order to identify students with a high risk of maladjustment. In the future, it is possible to build an individual program of adaptation measures for these students, depending on the test results.

By identifying vulnerable aspects of adaptation, university staff can implement targeted measures to alleviate the negative effects of emergencies. In this study, women showed a more pronounced stress response and were primarily responsible for these observed changes. Therefore, these measures could include the introduction of engaging online classes to foster social interaction, particularly for female students, and ongoing monitoring of students' adaptation throughout the semester.

Further study of academic adaptation is possible with the addition of this factor to the study, for example, the Big Five assessment: extroversion, agreeability, conscientiousness, neuroticism, openness to experience (Mammadov, 2022). This will help to identify the characteristics of a person prone to academic maladaptation, which will subsequently allow identifying a risk group among students at the university and will make it possible to provide them with the necessary assistance and support in a timely manner.

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