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Analysis of stress, coping strategies and happiness of urban and rural students during COVID-19 pandemic: A cross sectional study

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***Abstract*---**The present study aimed to analyze the Stress, Coping Strategies and Happiness of Urban and Rural Students during Covid-19 Pandemic. A sample of one hundred thirty postgraduate students was the subject for the study. Subjects were randomly selected from science departments Central University of Punjab, Bathinda, India. The Brief-COPE (Carver, 1997) 28 item self-report questionnaire assessed effective and ineffective ways to cope with a stressful life event. The DASS-21 developed by (Lovibond and Lovibond, 1995) evaluated recent experiences of stress, anxiety and depression. The Oxford Happiness Questionnaire (Michael Argyle and Peter Hills, 2002) assessed happiness. The data were analysed using the SPSS - 21 versions. The 2 X 2 Factorial MANOVA was applied for analyzing the scores of coping strategies and Stressful life and the multivariate effect of between subject factor (gender) is insignificant irrespective of age groups, Wilk's λ=0.98, F (4,123) = 0.58, p>=0.05, multivariate η2= 02. Multivariate effect of within -subject factor (Location) is significant irrespective of gender groups, Wilk's λ=0.90, F (4,123) = 3.47, p<=0.05, multivariate η^2= 10. There is no significant multivariate effect across the interaction between the gender and location, Wilk's λ=0.95, F (4,123) = 1.67, p>=0.05, multivariate η^2= 05. Whereas, in case of Stressful life Pillai's Trace test was used as assumption of homogeneity of covariance were violated and the multivariate effect of between subject factor (gender) is insignificant irrespective of age

groups, Pillai's Trace V = 0.05, F (3,124) = 2.21, p>=0.05, multivariate η^2= 05. Multivariate effect of within -subject factor (Location) is significant irrespective of gender groups, Pillai's Trace V = 0.08, F (3,124) = 3.40, p<=0.05, multivariate η^2= 08. There is no significant multivariate effect across the interaction between the gender and location, Pillai's Trace V = 0.01, F (3,124) = 0.30, p>=0.05, multivariate η^2= 00. Further, 2 X 2 Factorial ANOVA was calculated to assess the Happiness of students and results showed that the main effect of Gender, Location and interaction of Gender*Location were found not significant, F (1,130) = 0.56, p > .05, F (1,130) =.70, p > .05 and F (1,30) =1.71,p>.05 respectively. The above results concluded that urban and rural students significantly differ in Humor and Stress level but used the similar Avoidant, Approach to coping with handling the day-to-day stressful situations during the second wave of the covid-19 pandemic.

***Keywords*---**COVID-19, Coping Strategies, Happiness, Stress, Anxiety and Depression.

Introduction

The COVID-19 pandemic in India is also a part of the worldwide coronavirus disease 2019 (COVID-19) pandemic caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). In India first case of COVID-19 was found in Kerala on 27 January 2020 when a 20-year-old female was admitted to the hospital with symptoms of dry cough and sore throat for the last 24 hours, but she had not had any fever and shortness of breath (Andrews et al., 2020). After the first case, the following three cases were also found in Kerala by 3 February 2020, and all the infected people had returned from Wuhan (Kumar, K. Reji, 2020). On 4 March 2020, almost 14 people were infected, and most of them had a travel history. Transmission spread rapidly, and on 12 March 2020, a 76-year-old man became the first COVID-19 fatality in Karnataka, India (Hindustan Times, 2020). Due to the rapid transmission of COVID-19, the Indian government imposed a complete lockdown of 21 days to break the chain of infection. All the schools, colleges, and universities closed due to lockdown, and students attended online classes. By the mid of September 2020 highest cases were recorded with approximately 90000 within 24 hours and dropped to 15000 by January 2021. Universities were supposed to open, but by March 2021, the second wave knocked on the door of India, which was much more devastating than the first wave, with shortages of vaccines, hospital beds, oxygen cylinders and other medical supplies in the entire country (Michael Safi, 2021). The second wave of COVID-19 affected more people in rural areas. As a result, millions of learners from pre-primary to university were deprived of learning and education. Across the country, there is great inequality between rural and urban people and, therefore, different levels of resilience to the shocks that this disease has brought, putting the poor at long-term risk far beyond contracting the virus. This region regularly suffers from shocks which lead to localized learning interruptions. The learning gap will likely widen across urban and rural areas, as children from economically disadvantaged families cannot access e-learning. The transition from face-to-face to distance

learning has shone a spotlight on the vast inequalities within the education system. Inequalities are seen in the capacity of teachers, learning outcomes, the digital infrastructure provided by the government and access to technology (Nielsen, 2019).

COVID-19 can leave a devastating mark on the Psycho-physical health of students across the country (WHO, 2020a). The second wave of COVID-19 increased the mortality rate and led to enormous anxiety, stress, depression and uncertainty (UNESCO, 2020). Higher education students are especially prone to feelings of loneliness and experience higher rates of anxiety, stress, and depression than the general population (Diehl et al., 2018). During the era of COVID-19, due to social isolation, uncertainty, and abrupt transitions, students are prone to further worsening these feelings (Psychiatry, 2020). Under such circumstances, ignorance of the coping strategies and a low level of approach to life is also contributing factors to anxiety and stress. Coping strategies help individuals manage, reduce and master the situations that lead to stress. The feeling of happiness is different for different individuals, i.e. female adolescents find other ways of happiness, and male adolescents find different ways (Parmar K N., & Rudresh M. Vyas, 2018). Mental health has been severely affected by the COVID-19 infection owing to fear of the pandemic, and various coping strategies are observed (Ornell et al., 2020) affecting mental health care, human care, psychological crisis control measures, and intervention in COVID-19 (Li, SW. et al., 2020). The coping strategies should focus on the adolescents' problems and emotions (Rachana Parikh et al., 2019).

A study conducted by Cao et al., 2020, showed that approximately 25% of students experienced anxiety and stress, which positively correlated with increased concerns about academic delays and impacts on daily life. Due to the unprecedented disruptions in health education and other activities due to the COVID-19 outbreak (Alsoufi et al., 2020) are expected to affect students' psychological wellbeing further. Thus, students had to cope with their fears, anxiety, stresses, and insecurity. Dealing with a stressful event, like the COVID-19 crisis, affects physical health, medical conditions, and emotional well-being either positively or negatively (CDC, 2020). Numerous studies were conducted to examine the level of anxiety, stress, coping strategies and happiness of students before and during the first wave of the COVID-19 pandemic (Al-Qahtani and Alsubaie, 2020; Karyotaki et al., 2020; Tariq et al., 2020) but only limited studies were conducted during the second wave of COVID-19, especially in India. Therefore, the current study aimed to explore the effective and ineffective ways to cope with a stressful life event and psychological wellbeing approaches used by science students of the Central University of Punjab, India.

Material and Methods

Study design and setting

Researchers conducted a cross-sectional survey that involves urban and rural boys and girls students of science departments studying at the Central University of Punjab, Bathinda, India. A random sampling technique was used to collect data, and data was collected between 15 March 2021 to 15 June 2021 during the peak of the second wave of the Covid-19 pandemic; during this time, colleges and

universities were closed, and students were closed were attending classes through the virtual platform.

Participants

A sample of one hundred thirty postgraduate students were randomly selected for the present study. Out of which thirty-five boys & thirty girls were from rural whereas thirty-two boys & thirty-three girls from urban with ages of 21 to 25 years. All the subjects voluntarily took part in the study, and a detailed procedure was informed. All subjects signed a written consent form.

Tools

The Brief-COPE (Carver, 1997) 28 item self-report questionnaire assessed effective and ineffective ways to cope with a stressful life event. Avoidant Coping, characterised by the subscales of Denial, items 3 and 8, Substance use, items 4 and 11, Venting, items 9 and 21, Behavioral disengagement, items 6 and 16, Self-distraction, items 1 and 19, Self-blame, items 13 and 26. Approach Coping is characterized by the subscales of Active coping, items 2 and 7; positive reframing, items 12 and 17; planning, items 14 and 25, Acceptance, items 20 and 24, Use of emotional support, items 5 and 15, use of informational support, items 10 and 23. Humour, items 18 and 28, Religion, items 22 and 27), which correspond to a Likert scale ranging from 1(I have not been doing this at all) to 4 (I have been doing this a lot). The higher scores reflect a higher tendency to implement the corresponding coping strategy.

The DASS-21 developed by (Lovibond and Lovibond, 1995) was used to assess recent experiences of stress (“I found it hard to wind down”), anxiety (“I was aware of dryness of my mouth”), and depression (“I couldn’t seem to experience any positive feeling at all”). Each 7-item subscale is rated on a 4-point Likert scale ranging from 0 (Never) to 3 (Almost Always). Higher scores represent more significant symptomology.

The Oxford Happiness Questionnaire (Michael Argyle and Peter Hills, 2002) assessed happiness. All 29 questions are rated on a 6-point Likert scale ranging from 1 (Strongly Disagree) to 6 (Strongly Agree). The question number 1,5,6,10,13,14,19,23,24,27,28,29 are reverse scored (e.g. change 6 to 1) . After scoring all 29 questions, add the scoring of all questions and divide by 29 to get the happiness score. The lowest score possible is 1 indicates “Not Happy” and the highest possible score is 6 indicates “Too Happy”.

Statistical Analysis

Google form was used to collect data and transfer it to a Microsoft Excel sheet. SPSS version 22 was used to analyse the data, and 2 X 2 Factorial MANOVA was applied for analyzing the scores of coping strategies and stressful life. Further, 2 X 2 Factorial ANOVA was used to analyse the happiness scores. A *p-value* of less than 0.05 was taken for statistical significance. An independent t-test was used to determine the significant difference between gender and location.

Results

Results of the Shapiro –Wilk coefficients test stated that normality assumptions were met in the case of Avoidant & Approach Coping, Happiness. In contrast, normality assumptions were violated in Humor, Religion, Stress, Anxiety, and Depression with the $p < 0.05$. Box's Test of Equality of Covariance Matrices was used to check the assumption of homogeneity of covariance across the groups. Box's M (29.59) for Coping strategies (Avoidant, Approach, Humor, Religion) was not significant, p (.58) > (.05) indicating that there are no significant differences between the covariance matrices. Therefore, the assumption is not violated, and Wilk's Lambda is an appropriate test to use. Whereas in the case of Stressful life (Stress, Anxiety, Depression), variables assumption of homogeneity of covariance across the groups was violated as Box's M (39.03), p (.005) < 0.05 and Pillai's Trace test was more robust to use as the assumption of homogeneity of covariance was violated. Further, Levene's Test of Equality of Error Variances tests showed equal variance across the groups for Coping Strategies (Avoidant, Approach Coping, Humor, and Religion), Stressful life (Stress, Anxiety, Depression) and Happiness as $p > 0.05$.

The following output is from a 2 X 2 Factorial MANOVA between-subjects factorial design with independent variables being Gender (Male or Female) and Location (Rural or Urban). The dependent variables were the Coping Strategies and Stressful Life, and the results of the analysis appear below:

Table-1
Descriptive Statistics of the Data Measured of Coping Strategies and Stressful Life of Male and Female belonging to Urban and Rural

Variables	Sub-variables	Male			Female		
		Location	Mean	N	Location	Mean	N
Coping Strategies	Avoidant Coping	Urban	15.12±6.80	32	Urban	12.81±6.95	33
		Rural	13.86±5.64	35	Rural	14.96±5.48	30
	Approach Coping	Urban	20.38±6.14	32	Urban	21.21±6.73	33
		Rural	19.49±5.39	35	Rural	17.90±6.21	30
	Humour	Urban	3.16±1.19	32	Urban	2.79±1.70	33
		Rural	2.14±1.39	35	Rural	2.40±1.48	30
	Religion	Urban	3.49±1.37	32	Urban	3.70±1.78	33
		Rural	2.97±1.40	35	Rural	3.40±1.61	30
Stressful Life	Stress	Urban	9.25±4.14	32	Urban	8.36±4.40	33
		Rural	7.34±3.93	35	Rural	6.27±3.82	30
	Anxiety	Urban	8.69±4.22	32	Urban	8.30±4.47	33
		Rural	7.37±3.88	35	Rural	6.80±4.40	30
	Depression	Urban	7.50±4.23	32	Urban	8.70±4.52	33
		Rural	7.66±3.75	35	Rural	8.40±4.82	30
Happiness	Happiness	Urban	3.92±0.74	32	Urban	3.80±0.70	33
		Rural	3.81±0.97	35	Rural	4.15±0.75	30

Table1 shows descriptive statistics of Coping Strategies, Stressful Life and Happiness of male and female students belonging to India's urban and rural

areas. It is seen that Approach Coping strategies were more used by both male and female students. The same can be seen in figure 1.

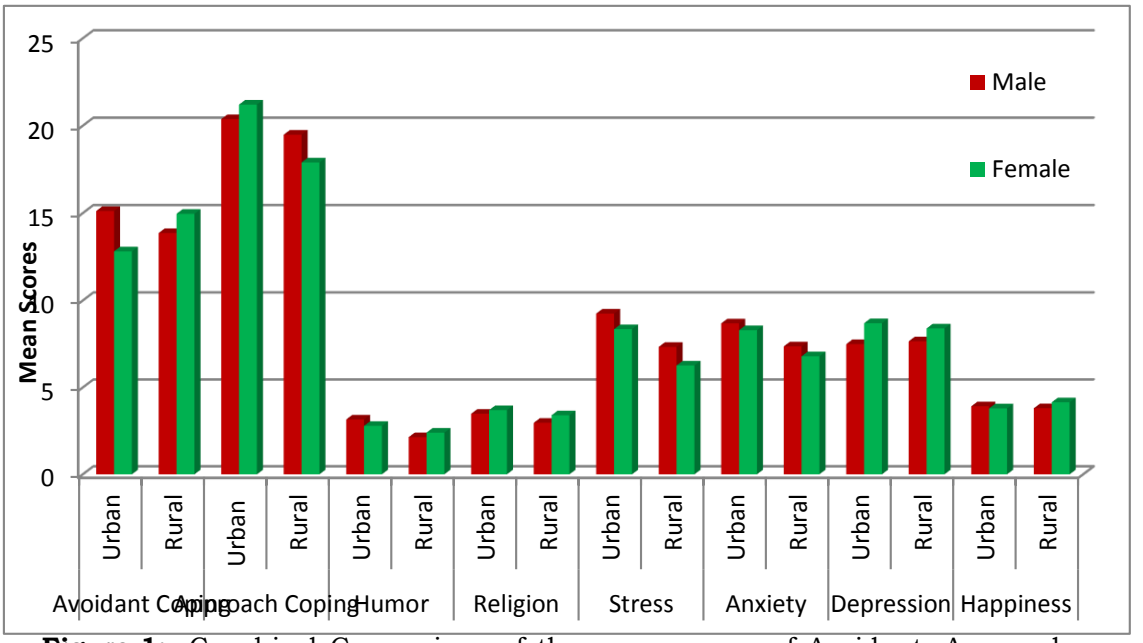

Figure-1:- Graphical Comparison of the mean scores of Avoidant, Approach, Humor, Religion, Stress, Anxiety, Depression and Happiness between boys and girls belonging to the urban and rural areas.

Table 2
Multivariate Tests[a]

Variables	Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Coping Strategies	Gender	Wilks' Lambda	0.98	0.58	4	123	.68	.02
	Location	Wilks' Lambda	0.90	3.47	4	123	.01	.10

	Gender*Location	Wilks' Lambda	0.95	1.67	4	123	.16	.05
	Gender	Pillai's Trace	0.05	2.21	3	124		.05
Stressful Life	Location	Pillai's Trace	0.08	3.40	3	124	.09	.08
	Gender*Location	Pillai's Trace	0.01	0.30	3	124	.02	.00
							.99	

*Significant at 0.05 level

The table 2 shows the results of 2 X 2 Factorial MANOVA and the multivariate effect of between-subject factor (gender) is insignificant irrespective of age groups, Wilk's $\lambda = 0.98$, $F(4,123) = 0.58$, $p > 0.05$, multivariate $\eta^2 = .02$. It indicates no significant group difference in the subject's response on the combined dependent variables between urban and rural students. Multivariate effect of within -subject factor (location) is significant irrespective of gender groups, Wilk's $\lambda = 0.90$, $F(4,123) = 3.47$, $p < 0.05$, multivariate $\eta^2 = .10$. It indicates that there is significant group difference in the subject's response on the combined dependent variables between the gender groups. There is no significant multivariate effect across the interaction between the gender and location, Wilk's $\lambda = 0.95$, $F(4,123) = 1.67$, $p > 0.05$, multivariate $\eta^2 = .05$.

Further, Pillai's Trace test was used as the assumption of homogeneity of covariance was violated in case of stressful life and the multivariate effect of between-subject factor (gender) is insignificant irrespective of age groups, Pillai's Trace $V = 0.05$, $F(3,124) = 2.21$, $p > 0.05$, multivariate $\eta^2 = .05$. It indicates no significant group difference in the subject's response to the combined dependent variables between urban and rural students. Multivariate effect of within-subject factor (location) is significant irrespective of gender groups, Pillai's Trace $V = 0.08$, $F(3,124) = 3.40$, $p < 0.05$, multivariate $\eta^2 = 08$. It indicates a significant group difference in the subject's response to the combined dependent variables between the gender groups. There is no significant multivariate effect across the interaction between the gender and location, Pillai's Trace $V = 0.01$, $F(3,124) = 0.30$, $p > 0.05$, multivariate $\eta^2 = .00$.

Table 3
ANOVA Table For Testing Between Subjects (Gender) Effect in Each Dependent Variable

Variable	Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
	Gender	Avoidant	11.61	1.00	11.61	.30	.59
		Approach	4.54	1.00	4.54	.12	.73
		Humour	.10	1.00	.10	.05	.83
		Religion	3.49	1.00	3.49	1.46	.23

Coping Strategies	Location	Avoidant	6.28	1.00	6.28	.16	.69
		Approach	142.98	1.00	142.98	3.81	.05
		Humour	15.90	1.00	15.90	7.50	.01
		Religion	5.11	1.00	5.11	2.14	.15
	Gender * Location	Avoidant	94.54	1.00	94.54	2.42	.12
		Approach	47.55	1.00	47.55	1.27	.26
		Humour	3.17	1.00	3.17	1.49	.22
		Religion	.33	1.00	.33	.14	.71
	Gender	Stress		1.00	31.20	1.87	.17
		Anxiety	31.20	1.00	7.40	.41	.52
		Depression		1.00	30.48	1.63	.20
			7.40				
			30.48				
Stressful Life	Location	Stress		1.00	129.87	7.79	.01
		Anxiety	129.87	1.00	64.37	3.58	.06
		Depression		1.00	.16	.01	.93
			64.37				
			.16				
	Gender* Location	Stress		1.00	.29	.02	.89
		Anxiety	.29	1.00	.28	.02	.90
		Depression		1.00	1.67	.09	.77
			.28				
			1.67				

Table 3 shows location has a statistically significant effect on Humor (F = 15.90, p < 0.05) and Stress (F = 7.79, p < 0.05). As the ANOVA was significant for location in Humor and Stress, an independent sample t-test was used to find a significant difference between urban and rural students.

Table 4
Comparison of Mean Scores of Humor and Stress using Independent Samples t-Test

Variables	Location	N	Mean	SD	Mean Difference	t	df	Sig.
Humor	Urban	65	2.97	1.48	0.71	2.78	128	0.01
	Rural	65	2.26	1.43				
Stress	Urban	65	8.80	4.27	1.95	2.73	128	0.01
	Rural	65	6.85	3.89				

*Significant at 0.05 level

Table 3 reveals a significant difference between urban and rural students in Humor and Stress as the obtained $p < 0.05$. Further, it is seen that the Humor of urban students is better than rural students, and urban students experience more significant stress compared to rural students. The same can be seen in figure 2.

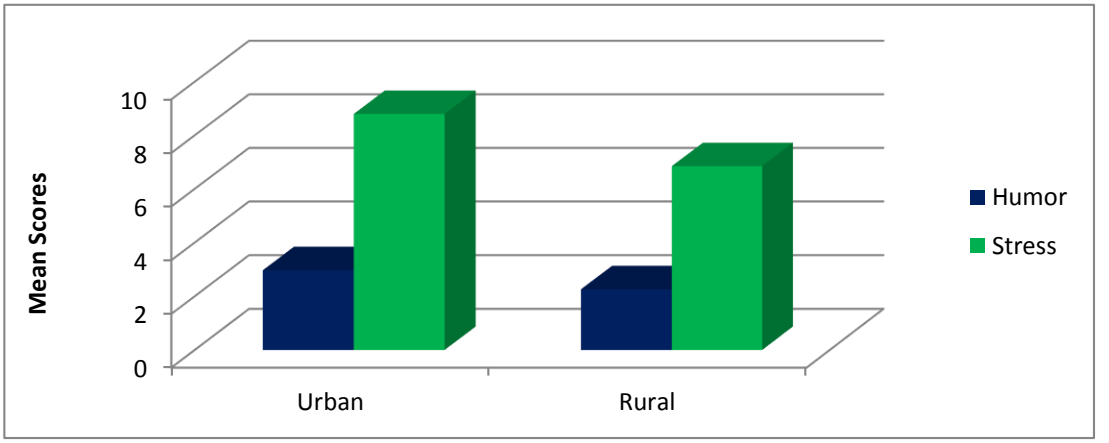

Figure 2: Graphical Comparison of the mean scores of Humor and Stress of Students belonging to an urban and rural area

Table 5
Summary of 2 X 2 Factorial Design ANOVA of Happiness of Students

Source of Variance	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Gender	.37	1	.37	.58	.45	.00
Location	.45	1	.45	.70	.40	.01
Gender * Location	1.71	1	1.71	2.67	.11	.02
Error	80.97	126	.64			
Total	2075.72	130				

Table 5 showed that the F-Value for gender, location, and the interaction between gender and location were found insignificant at a 0.05 level of significance. It indicates that the mean happiness scores of male and female students belonging to urban and rural areas did not differ significantly. It may, therefore, be said that both male and female students belonging to the urban and rural areas were found to have happiness to the same extent. Further, it may be said that happiness was found to be independent of the influence of interaction between gender and the location status of students.

Discussions

Different waves of Covid-19 have adversely affected college and university students' physical and mental health. Due to the second wave of Covid-19 colleges, universities were again closed. Frequent revisions of the instructions regarding online-offline classes, assignments, practicals, field studies, examination, minimal face to face peer group interactions and the digital divide pushed the students under more traumatic conditions. Furthermore, lack of participation in the excursion, co-curricular and extracurricular activities intensified vulnerabilities towards the distress of university students. Due to the study loss, the pressure of self-study, and uncertainty about future study continuation, science students were more tense, anxious, and had a fear of infection. In India, approximately 70% population resides in rural areas, and researchers put effort into examining the effective and ineffective ways to cope with stressful life events and psychological wellbeing approaches used by male and female science students of the Central University of Punjab, India, belonging to urban and rural areas. The present study's findings revealed that urban students experienced more stress than rural students and used better Humor to mitigate tension, anxiety, and depression caused due to the outbreak of the second wave of Covid-19. It may be because, in urban areas, the episode of Covid-19 was more perilous and spread very rapidly from city to city, which resulted in more people being infected in the towns in India. Arenliu and Berxulli, 2020 stated that Covid-19 adversely influenced the mental health of students and approximately 50% experienced psychological distress. A study conducted by Cao W et al., 2020; Huang L et al., 2020 and Chang et al., 2020 reported that college students in China had high mental health problems. Students adopted a wide range of coping strategies to cope with stressful life situations, although approach coping was most often used by students. It means that students applied active coping, acceptance or positive reframing to handle the pressure of the stressful situation. Students were associated with more helpful responses to adversity, including practical adaptive adjustment, better physical health outcomes and more stable emotional reactions. Students manage their emotions to promote their physical and mental health.

However, urban students also applied humour coping more as they experienced greater stress and pressure. Humour coping helped the students reassess stressful events positively (Martin et al., 1993). Results of the present study support the view that Humor coping minimises the body's negative response and increases the feeling of helpful answers to difficulty (Kuiper et al. 1993; Kuiper et al. 1995). Therefore, coping Humor is commonly used to deal with pressure (Martin, 2007, 2016; Demjen, 2016; Morse et al., 2018). However, although a high likelihood of choosing positive coping strategies was reported, participants had a high level of stress which is the serious impact of the second wave of Covid-19 (Roll et al., 2020). The feeling of Happiness was the same in boys and girls belonging to urban and rural areas; it is mainly due to the healthy family environment and support, which helped the student manage stress, anxiety, and depression during the Covid-19 second wave pandemic. However, due to the rapid spread of the second wave of Covid-19 urban students experienced more stress.

Conclusions

Almost all levels of students were affected by the first and second waves of COVID-19, but the second wave was more intensified and affected students' mental health. Students face loss in their studies and insecurities about their careers, which may lead to mental stress. This study concludes that urban students are having more stress and use coping humour strategies to handle it. Overall, students used more Approach Coping strategies to handle the pandemic situation and maintain balance in life. The need of the hour is to develop a productive student welfare system, student-friendly environments, and regular periodic extracurricular activities with universal participation that can prove to be valuable stress-busters during the pandemic. Finally, appropriate coping strategies help the students avoid stressful life and enhance psychological well-being.

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