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Association of Perceived Stress Levels Amidst COVID-19 Pandemic with Bio-Social Parameters and Prakriti Body Types among the adult's population of Manipur, India

Research Article

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Abstract

Background - Perceived stress experiences differ amongst individuals due to psychological, physical and socio-economic factors and with the outbreak of COVID-19, the impact on mental health has been unavoidable. Another dimension of understanding stress is also put forth by Ayurveda, an ancient medicine system of India. Aim – Aims to find the association of bio-social parameters including *prakriti* body types with perceived stress levels amidst COVID -19 pandemic. Material and Methods – Data were collected from 390 individuals aged ranging from 18 – 45 years through an online survey. Prakriti were determined by *prakriti* assessment questionnaire. Stress level was assessed by using Perceived Stress Scale (PSS 10) and relevant statistical analysis were carried out. Results - Significant association ($p < 0.05$) is found in body mass index (BMI), *prakriti* body types, sex, and effects of COVID–19 on mental and physical well – being with perceived stress levels. *Vata prakriti* (19.71%), underweight individuals (12.65%), and females (11.44%) are significantly more prone to develop high stress. Salaried individuals are significantly less likely to be affected by moderate stress. VIF is less than 5 and Tolerance is greater than 0.2. And, Nagelkerke value is found to be 29.3%. Conclusion – The study concludes that there is a significant association of biosocial parameters including *prakriti* body types with perceived stress levels amidst COVID–19 pandemic.

Key Words: *Stress, Prakriti, Body Mass Index, Biosocial, COVID-19.*

Introduction

The word stress has become almost synonymous with the ever-challenging present-day world posed due to occupational, social and environmental stress, etc. along with dealing with the ordinary process of living a life (1). With the declaration of Coronavirus Disease 2019 (COVID–19) as a Pandemic by the World Health Organization in March 2020, stress and its associated symptoms arising out of a public health emergency was expected. Stress is a dynamic concept which emphasizes the role of cognitive factors (thoughts, attitudes, beliefs & images), physical, emotional and behavioral responses to events or situation that are appraised as threatening or challenging (2). However, an individual's way of coping plays an important factor in the appraisal and management of any stress-inducing event or stressor.

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Changes arising out of the new norm of daily life has put a toll on mental health on the population irrespective of age with restrictions on our social life, educational institutes being shut down, the home was the new job place, etc. for an unknown period due to lockdown imposed in various countries (3–5). Appraisal and response to stress can be individual specific therefore fear, worry and sadness of varying degrees affects the psychological and physical health and perhaps leading to behavioral addiction including excessive alcohol use and smoking or other substance, increased screen time exposure.

Another dimension in understanding stress and a person's body type were put forth by Ayurveda, a traditional medicine system of India. According to Ayurveda, the human body is divided into three major body types known as *prakriti* body types comprising of *Vata, Pitta, and Kapha*. These three categories form the essential regulatory ideologies of the body-mind classification and are touted as the *Tridosha* concept and represent the individual's physical and psychological traits predispositions present since birth and had also played a role in diagnosis and treatment since the ancient times (6). The *doshas* are present in every individual in varying degrees however one of the *doshas* is more prominent than the other and hence determines the personality characteristics as well as

physiological function of the individual (7). Understanding the various factors associated with stress would aid in bringing about a holistic approach in gaining more insight to put forth effective stress-related interventions/management programs for any adverse health outcomes. As stress forms an integral part of our existence without which our lives would become redundant. Therefore, the present study aims to associate the biosocial parameters including *prakriti* body types with perceived stress level amidst the COVID–19 lockdowns.

Materials and Methods

Sample and Design

The present study is conducted among the adult's population of Manipur, India. The data were collected through online data collection, during July – August 2020. A total of 390 (154 males and 236 females) individuals aged ranges from 18 – 45 years were included in the study. The questionnaire includes personal information's (age, sex, place of residence, occupation, self-reported height and weight), impact of COVID-19 on their mental and physical well-being, *prakriti* assessment questionnaire, and perceived stress scale – PSS 10. The objective of the study was explained in the questionnaire and self-declaration informed consent was taken before submitting the questionnaire.

Data Management

Place of residence was recorded as urban and rural residence, occupation as salaried and non-salaried, and self-reported height and weight of the individuals. The *prakriti* body types of the respondence were determined by filling up of the *prakriti* assessment questionnaire developed by the Victorian Institute of Yoga Education and Teacher Training *(https://www.viyett.com.au/files/Ayurvedic-Constitution-Questionnaire.pdf)*. Each question had three options which were the characteristics of each body types i.e. *vata, pitta, and kapha*. The *prakriti* body type is given based on the maximum attributes in the totality.

Stress level is estimated by using the perceived stress scale - PSS 10 (Cohen et al., 1983). Perceived Stress Scale 10 or PSS 10 is a self-report assessment tool to measure how an individual appraise stressors in life. It consists of a 10-item questions based on 5-point Likert scale ranging from 0 (never) to 4(very often) with reverse scoring being done for 4(four) items. After summing up the scores from all the items, the total scores are categorized into low, moderate and high perceived level of stress.

Statistical analysis

Relevant statistical analysis is carried out using IBM SPSS Statistics Version 26. Chi-Square and ANOVA analysis were carried out to determine the association between the level of perceived stress and biosocial parameters including *prakriti* body types, and the contingency coefficient is calculated to determine the strength of association. Multi-logistic regression analysis is also carried out to find out the likeliness of developing stress considering different biosocial parameters and *prakriti* body types. Multicollinearity indexes (Tolerance and VIF) were calculated to find out the level of correlations between the independent variables.

Result

The present study revealed a significant association of perceived stress levels and certain biosocial parameters including the *prakriti* body types.

Table no. 1: Bio-social parameters description of the respondent including *prakriti* body types

Parameters		Perceived Stress Levels			P-value	Contingency coefficient (C)
		Low	Medium	High		
Age		26.25 ± 5.16	25.64 ± 5.14	23.91 ± 5.00	0.696*	-
BMI		24.88 ± 9.34	23.18 ± 9.24	21.43 ± 9.74	0.258*	-
Sex	**Male**	21 (13.63)	128 (83.11)	5 (3.24)	**0.014****	14.6%
	Female	26 (11.01)	183 (77.54)	**27 (11.44)**		
Prakriti	**Vata**	1 (1.40)	56 (78.87)	**14 (19.71)**	**0.000****	32.8%
	Pitta	34 (12.68)	208 (77.61)	26 (9.71)		
	Kapha	12 (23.53)	35 (68.62)	4 (7.84)		
Place of residence	**Urban**	32 (12.69)	196 (77.77)	24 (9.52)	0.350**	-
	Rural	15 (10.86)	115 (83.33)	8 (5.79)		
Occupation	**Salaried**	22 (15.60)	107 (75.88)	12 (8.51)	0.253**	-
	Non - Salaried	25 (10.00)	205 (82.00)	20 (8.00)		
Effect of COVID - 19	**Yes**	5 (3.01)	140 (84.33)	**21 (12.65)**	**0.000****	29.3%
	May be	18(16.98)	106 (79.69)	9 (6.76)		
	No	24 (26.37)	65 (71.42)	2 (2.19)		
BMI Status	**Underweight**	3 (7.69)	29 (74.35)	**7 (17.94)**	**0.020****	19.2%
	Normal	14 (7.91)	149 (84.18)	14 (7.91)		
	Overweight	11 (13.75)	63 (78.75)	6 (7.50)		
	Obese	19 (20.21)	70 (74.46)	5 (5.31)		

***ANOVA Analysis, **Chi-Square Analysis**

Table no.1 illustrates the anova analysis, chi-square value and contingency co-efficient of different parameters. A significant correlation is found in sex ($p < 0.05$), *prakriti* body types ($p < 0.001$), effects of COVID–19 on mental and physical well – being ($p < 0.001$) and body mass index (BMI) status ($p < 0.05$) with perceived stress levels. And the contingency co-coefficient (C) or strength of relationship found in sex, *prakriti* body types, the effect of COVID–19, and BMI status with perceived stress levels are 14.6%, 32.8%, 29.3%, and 19.2% respectively. Whereas, no significant association ($p > 0.05$) is found in age, place of residence, and occupation with perceived stress levels. Females (19.71%) are more significantly ($p < 0.05$) affected by high-stress levels than males (11.44%). In *prakriti* body types, *vata prakriti* individuals (19.71%) are more significantly ($p < 0.001$) affected by the high-stress levels followed by *pitta* (9.71%) and *kapha* (7.84%) *prakriti* individuals. Coming to the BMI status, the underweight (17.94%) individuals are more significantly ($p < 0.05$) attributed to the high-stress levels category trailed by normal (7.91%), overweight (7.50), and obese (5.31%) individuals.

Table no. 2: Odd Ratio (OR) analysis for assessing risk factors for perceived stress levels

Parameter Estimates (Multinomial Logistic Regression Analysis)					
Level of Perceived Stress [a]			**Sig.**	**OR**	**Nagelkerke**
Moderate	Gender	Male	0.655	1.179	
		Female	.	.	
	Age		0.775	0.988	
	Place of Residence	Urban	0.793	0.906	
		Rural	.	.	
	Occupation	Salaried	**0.034**	**0.446**	
		Non-Salaried	.	.	
	Effect of COVID–19 on Mental Health and Physical well – being.	Yes	**0.003**	**5.229**	
		May be	0.050	0.481	
		No	.	.	
	Prakriti Body Types	Vata	**0.014**	**16.592**	
		Pitta	**0.069**	**2.286**	
		Kapha	.	.	
	BMI Group	Underweight	0.925	1.078	
		Normal	0.118	2.011	
		Overweight	0.656	1.228	
		Obese	.	.	
High	**Gender**	Male	**0.032**	**0.249**	**29.3**
		Female	.	.	
	Age		**0.017**	**0.843**	
	Place of Residence	Urban	0.646	1.308	
		Rural	.	.	
	Occupation	Salaried	0.631	0.757	
		Non-Salaried	.	.	
	Effect of COVID–19 on Mental Health and Physical well – being.	Yes	**0.001**	**9.137**	
		May be	**0.046**	**0.174**	
		No	.	.	
	Prakriti Body Types	Vata	**0.005**	**42.596**	
		Pitta	0.491	1.690	
		Kapha	.	.	
	BMI Group	Underweight	0.929	1.099	
		Normal	0.493	1.653	
		Overweight	0.525	1.660	
		Obese	.	.	

a. The reference category is: low.

Tables no. 2 shows the odd ratio analysis for assessing risk factors of perceived stress levels on different biosocial parameters including *prakriti* body types during the COVID–19 pandemics. In this multinomial logistic regression analysis, the VIF is less than 5 and Tolerance is greater than 0.2 which means that there is no multicollinearity between the independent variables and the Nagelkerke value is found to be 29.3% which means that 29.3% of the perceived stress levels is controlled by the given variables. From the present study, it is revealed that salaried individuals are significantly ($p < 0.05$) less likely to be affected by the moderate stress level in comparison to the non – salaried individuals. Individuals who believed that COVID–19 affected their mental and physical well-being are significantly more likely to be affected by the moderate and high-stress levels, while those who are not sure are significantly

less likely to be affected by the moderate and high-stress levels. Coming to the *prakriti* body types, *vata prakriti* individuals are significantly ($p<0.05$) more likely to be affected by moderate and high stress levels than the pitta and *kapha prakriti* individuals. Between *pitta and kapha prakriti* individuals, *pitta prakriti* individuals are significantly ($p<0.05$) more likely to be affected by moderate stress levels than the *kapha prakriti* individuals. In the BMI status, there is no significant difference in the likeliness of developing moderate and high stress levels between the BMI status categories.

Discussion

Biosocial as an approach encompasses social, culture, economic and biological factors which effects the wellness of an individual (9) thereby it correlates with the perceived stress, the degree or level to which stress experiences are perceived in one's life (10). Studies have implicated that socioeconomic factors such as age, gender, education level, type of occupation, income, place of residence, etc. are main determinants of psychological wellbeing. Women tend to be more affected than men by stressor (events that cause a stress reaction) and use an emotional-focused coping style (11). Stress at the workplace or job stress may elevate due to lack of job security, conflicts, long hours, lack of control, work dissatisfaction, etc. which leads to poor mental and physical health by often causing a burnout (Murphy, 1995). Work stress has given arisen to overweight and obesity issues due to the sedentary lifestyle with a high body mass index (BMI; kg/m^2) and has become a public health problem (12). The manifestation of stress in the form of anxiety and depression due to COVID-19 was evident with women more susceptible to anxiety risk than men. Also, those working in professional services were had lesser stress than industrial services, daily wage earner, etc. thereby indicating that type of occupation has a role in stress appraisals (3,13).

The three *prakriti* body types also have different activation levels of the brain. The prefrontal cortex responsible for executive functions (problem-solving, decision-making, etc.) is easily overstimulated for Vata dosha making them quick to react, creative but usually inattentive and forgetful. While pitta prakriti type exhibit ambitiousness, like challenges, focused and perseverant whereas, *kapha prakriti* types are not easily stimulated, once interested get into rational thinking and action. The limbic system which is involved with the emotional response is easily instigated for *vata prakriti* making them vulnerable to mood swings, tendency to fear in excess, and develop phobias; while pitta *prakriti* body types are irritable, quick to get angry, sensitive, and are competitive. On the contrary *kapha prakriti* body types are calm, stable, sensible, and are usually happy but are also susceptible to depression (14)

The present study also revealed that peoples who thought that their lives were affected by the impact of the COVID-19 pandemic are more prone to develop high-stress levels than the other individuals and the psychosocial impact of COVID-19 was experienced by the general population and was not subjugated to a few strata with mental health being compromised on people with transient grades (13) suggesting that such individuals were predisposed to experience chronic stress (5) while those who are not sure are significantly less likely to be affected by the moderate and high-stress levels that can be explained by personality traits like resilience and have a healthy coping styles making them less prone to stressors (15–17). Substantial evidence on previous research has implicated that higher BMI individuals experienced chronic stress (18,19) which somehow contradict with our findings that lesser the BMI has a greater percentage of high-stress levels with perceived stress levels. Whereas, a cohort study conducted in Scottish men and women had a good agreement with our findings which also reported that high level of stress is mostly common in the individuals with lower BMI (20).

Moreover, it is also revealed that salaried individuals are significantly less likely to be affected by the moderate stress level in comparison to the non – salaried individuals due to the financial insecurities that are attached, as being economically adequate forms one of the safeties needs essential to humans as given in "Maslow Hierarchy of Needs". Age as a parameter has a significant relationship with perceived stress levels because younger people tend to experience more hassles due to financial issues, conflict in the work environment as well as personal relationships (21). Meanwhile, the gender difference is also observed, with women more at risk for high perceived stress levels than men as women are greater in emotional involvement, are exposed to greater stressors apart from the daily life role functioning for the family and society, aggravated further by the greater burden of demands and limitations in their workplace (22). Furthermore, in *prakriti* body types - *vata prakriti* individuals are prone to the development of moderate and high stress than the other prakriti body types, and *pitta prakriti* individuals are significantly more likely to be affected by moderate stress than the *kapha prakriti* individuals which somehow correlates with the psychological characteristics of different *prakriti* body types as described in the ayurvedic text (14) since the *tridosha* has different psychosomatic constitutions which in turn determining the psychological state of an individual's (23) but varying degree on mean and woman (22). This may be attributed to how the life events or stressors are dealt making them more vulnerable to any negative events as *vata dosha* being highly mobile has their stress responses easily activated to high-stress levels. Pita prakriti is inherently quick to react to stress but also has the dynamics to take it in a challenging way, making them good in problem resolutions (14). Whereas, *kapha prakriti* is more stable which is ascribed by the high parasympathetic response of the body than the other prakriti body types (24).

Conclusions

The present study establishes the association of perceived stress levels with different biosocial parameters including the *prakriti* body types. Body mass index and *prakriti* body types show a positive association with perceived stress levels. The impact of COVID-19 also shows a positive relationship with the perceived stress levels. In risk assessment of stress levels, salaried individuals are less likely to develop moderate stress than non-salaried individuals. Individuals who thought that COVID-19 had impacted their mental and physical well-being are more likely to

be affected by moderate and high-stress levels. In the case of *prakriti* body types and perceived stress levels, *vata prakriti* individuals are more prone to be affected by stress. The findings in the study have highlighted the important aspect of how the prakriti body types respond to stress which would aid in measures to bring about a holistic approach to more effective stress management techniques inculcating the Ayurveda concept. Further research in the area of Ayurveda and its correlation to various mental health parameters can be an interesting study.

Conflict of Interest

All the authors have declared that there is no conflict of interest.

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