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***Corresponding author**.

anandusureshuthradam@gmail.com

Perceived Stress Levels and its Associated Factors Among Urban Population of Gandhinagar: A Community-Based Cross-Sectional Study

Anandu S[1]*, Wasim Anjum[2]

1 Postgraduate, Department of Community Medicine, SDUMC, Kolar, Karnataka, India
2 Associate Professor, Department of Community Medicine, SDUMC, Kolar, Karnataka, India

Abstract

Growing stress in the developing world is a sign of unresolved physical and emotional tensions. Chronic stress has a detrimental effect on one's health and well-being. The data regarding the levels of perceived stress and its related factors among general population of India is sparse. To assess the perceived stress levels and their related factors among the urban population of Gandhinagar. Data collection was from the residents of Urban field practice area of Gandhinagar, Kolar. A pretested semi-structured questionnaire has been used for the data collection. The houses were chosen using systematic random selection. Study design was a community-based Cross-sectional study. PSS-10 scale was applied to estimate the perceived stress. The research was conducted between October 2022 to February 2023 after getting the clearance from institutional ethics committee. Based on the prevalence of any mental health disorders in India as per National Mental Health Survey (2015-2016) as 10% with alpha error of 5% with 95% confidence interval the minimum sample size calculated was 144 [calculated by Open Epi version 3.01]. For this study, households served as the sample unit. All data was inserted in Microsoft office excel sheet, investigated by SPSS v 22 (IBM Corp). The t-test and the "ANOVA test", with significance level being defined as "$p < 0.05$", was used to find out whether there was significant mean difference between 2 or more groups in perceived stress. Linear regression was performed to find out how much the various factors can predict the perceived stress scores. The univariate analysis showed that habits of smoking, alcoholism, occupation, and socioeconomic status were the factors which can predict the perceived stress levels. When multiple linear regression was done, only the SES was predicting the perceived stress levels. Higher the SES lesser the perceived stress levels. Perceived stress in low socioeconomic status was high with habit of smoking, alcoholism, marital status, and occupation being its covariates. Future research must evaluate

the social networks' role in Indian environment as a means of dealing with perceived stress.

Introduction

Rising stress in the developing world is a result of unresolved physical as well as mental pressures exacerbated by a rapidly transforming economic, demographic, and sociocultural environment. Chronic stress significantly affects well-being and health in terms of mental health, diabetes, cardiovascular disease, obesity, and so on.[1–5]Stress is a vibrant term that is impacted due to the interaction between the individual and environment, and its impact on the people varied according to his / her coping skills.[6]Sociocultural environments influenced by medical, physical, psychological, and psychosocial factors compose perceived stress, that measures the level to which circumstances in one's life are evaluated as stressful.[7] The evaluation of this felt stress is thought to surpass evaluation of actual stressful life experiences.[8]

Sociodemographic characteristics (such as neighborhood profile, educational level, socioeconomic position, and gender) as well as behavioral risk factors (such as alcohol and smoking intake) have also related to perceived stress, according to previous research.[9–14] However, most of the Indian research on perceived stress was undertaken within specialized demographic subgroups, and data on perceived stress and related variables in overall population are lacking.[15] Understanding the elements related to stress among Indian people can aid in the creation of community-based treatments for stress reduction. In addition, early identification of individuals as well as subgroups with stress-related risk factors accumulation can give chances for early strategic intervention in the avoidance of negative health and behavioral outcomes.[11] The PSS ("Perceived Stress Scale"), established by Sheldon Cohen, is a self-appraisal measure used by people to evaluate the perceived stressfulness of their varied life circumstances.[16] The data regarding the levels of perceived stress and its related factors in general Indian population is sparse, hence this study was undertaken to have an insight into the perceived stress levels among the Urban population of Gandhinagar, Kolar.

Objectives

To assess the perceived stress levels and their associated factors among the urban population of Gandhinagar.

Materials and methods

Data collection was from the residents of Urban field practice area of Gandhinagar, Kolar. For the data collection, a pretested semi-structured questionnaire was utilized. Systematic random sampling was used to select the houses. Study design was a community-based Cross-sectional analysis. All above 18 years and maximum 2 people of opposite sex from each house had been included. PSS-10 was utilized to measure perceived stress. PSS is the utmost utilized psychological tool for evaluating stress perception. It evaluates the extent to which circumstances in one's life are evaluated as stressful. The PSS includes questions that inquire about emotions and ideas from the previous month. Individual PSS scores can vary between 0 - 40, with the greatest levels indicating more perceived stress. Scores ranged between - 0 to 13 will be considered low stress; 14 to 26 will be considered moderate stress; 27 to 40 will be considered as high perceived stress.[16] The scale was linguistically verified in Kannada, the native language. The translating procedure included: (1) A native Kannada speaker translated the original PSS

forward into Kannada, (2) the back-translation into English has been performed by another native speaker. Among 10 individuals who were not involved in the study the translated version was pretested. The PSS was verbally managed to participants who lacked functional literacy, illiterate or to those requested it. The study was conducted between October 2022 to February 2023. Based on the prevalence of any mental health disorders in India as per National Mental Health Survey (2015-2016)[17] as 10% with alpha error of 5% and at 95% confidence interval the minimum sample size calculated was 144 [calculated by Open Epi version 3.01].

For this study, households served as the sample unit. The houses were chosen using a systematic random sampling method. Every ninth house was chosen. Those houses which were locked were visited 3 times more at different timings. In the case that the same house could not be visited or no available qualified person was living there, the next residence was chosen. Two people, each of the opposing sexes, from each family household were allowed to participate in the study. The research participants were chosen at random by a draw of lots if more than one eligible person was present in the same household. Each day, a maximum of 20 people might be enrolled.

Analysis & Statistical Methods

SPSS v. 22 was used to examine all data, which was put into a Microsoft Office Excel sheet (IBM Corp). The use of descriptive statistics was used. Percentage and frequency represent categorical variables while mean ± standard deviation expresses continuous data. The significance level was set at $p < 0.05$ for both the t-test & the ANOVA test were used to ascertain statistically significant mean differences in perceived stress levels between 2 or more groups. Linear regression was performed to find out how much the various factors can predict the perceived stress scores.

Results

Total 283 participants were interviewed for the research.

Most of the participants belong to groups 34-50 years (40.9%) of age. 56.3% of the participants were females. Almost all (98%) were Hindu by religion. 92.5% were married and majority (57.3%) belongs to joint families. Majority of the participants interviewed were semiprofessionals. Regarding educational status, most of them were educated up to high school (20.8%) and post-high school diploma (20.8%). According to the modified BG Prasad's classification, most of the participants belong to class II. (Table 1)

4% of the participants were smokers and have the habit of taking alcohol (Table 2)

3% of the participants were having hypertension and 4 4% were diabetic (Table 3)

Table 2. Distribution of participants with respect to habit of smoking and alcoholism

| Habit		Percentage
Smoking	No	289(98.6%)
	Yes	4(1.4%)
Alcoholism	No	289(98.6%)
	Yes	4(1.4%)

Table 3. Distribution of participants with respect to the presence of various co-morbidities

Co-morbidities		Percentage	Mean+/-SD (PSS scores)
Hypertension	No	260(88.7%)	16.07+/-5.84
	Yes	33(11.3%)	17.12+/-6.07
Diabetes	No	280(95.6%)	16.05+/-5.81
	Yes	13(4.4%)	19.15+/-6.5

Table 4. Perceived stress levels among the participants

PSS	Percentage	Mean PSS+/-SD
Mild Stress group	79(27.0%)	
Moderate stress group	204(69.6%)	16.19+/-5.86
Severe stress group	10(3.4%)	

Majority of the participants 69.6% were having moderate stress while 3.4% have severe stress. The mean PSS score was 16.19 among the participants (Table 4)
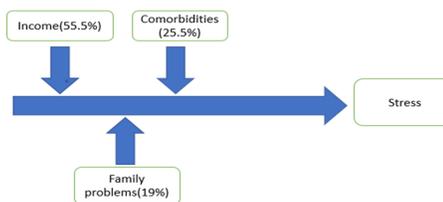
Fig 1. Fish bone diagram showing the perceived reasons for the participant's stress

Those who are having the habit of smoking and alcoholism they are having increased mean PSS scores compared to those who do not smoke or consume alcoholism and this relationship was obtained to be significant statistically. Among the sociodemographic factors, occupation, marital status, and socioeconomic status have shown significant relationship with perceived stress scores statistically. Participants who were married are having higher mean perceived stress scores compared to those who were unmarried. In occupation, those who are having skilled jobs are having statistically significant differences in mean PSS scores compared to the professionals. (Table 5)

Regression analysis showed negative association between gender, religion, SES, marital status, and type of family, and

Table 1. Socio-demographic characteristics of the participants

Characteristics	Categories	Counts (Percentages)	Mean+/-SD (PSS scores)
Age in years	18-34 years	108(36.8%)	16.24+/-6.01
	34-50 years	120(40.9%)	15.54+/-3.58
	>50 years	65(22.3%)	15.92+/-6.08
Gender	Male	128(43.7%)	16.54+/-5.57
	Female	165(56.3%)	15.92+/-6.08
Religion	Hindu	287(98%)	16.20+/-5.88
	Muslim	5(1.7%)	16.40+/-5.41
	Others	1(0.3%)	-
Marital status	Married	271(92.5%)	16.24+/-6.01
	Unmarried	22(7.5%)	15.54+/-3.58
Type of family	Nuclear	120(41.0%)	16.54+/-5.57
	Joint	168(57.3%)	15.92+/-6.08
	Three generation	5(1.7%)	-
Occupation	unemployed	33(11.3%)	16.57+/-4.35
	unskilled	17(5.8%)	17.53+/-5.76
	semiskilled	26(8.9%)	16.65+/-5.88
	skilled	46(15.7%)	13.54+/-5.96
	Clerical/shop/farmer	59(20.1%)	16.27+/-5.67
	semiprofessional	89(30.4%)	17.39+/-4.83
	Professional	23(7.8%)	16.66+/-6.43
Education	Illiterate	36(12.3%)	17.08+/-4.32
	Primary school	51(17.4%)	15.07+/-6.44
	Middle school	36(12.3%)	16.08+/-5.68
	High school	61(20.8%)	15.91+/-5.16
	Intermediate/post-high school diploma	61(20.8%)	16.73+/-6.16
	Graduate/postgraduate	18(6.1%)	14.55+/-5.27
	professional	36(12.3%)	17.56+/-7.47
Socioeconomic status (Mod.BG Prasad's Classification)	I	68(23.2%)	15.03+/-5.27
	II	81(27.6%)	17.03+/-5.21
	III	58(19.8%)	16.02+/-6.64
	IV	79(27.0%)	16.30+/-6.03
	V	7(2.4%)	18.14+/-9.02

perceived stress scores but this association was statistically significant only for SES. All the above factors were able to predict 7% of the changes in the perceived stress scores. (Table 6)

Discussion

The study shows that the mean PSS score was 16.19 with very severe stress present in the 3.4% of the participants. Moderate to severe stress was found in 73% of the participants which is way more than the figures obtained through National Mental Health Survey (2015-2016).[17]

When asked about the reasons for being stressed the participants pointed out low income, presence of co-morbidities among family members, and family problems as the main reasons.

The univariate analysis showed that habit of smoking, alcoholism, occupation, and socioeconomic status were the factors which can predict the perceived stress levels. When multiple linear regression was done only the SES was predicting the perceived stress levels. Higher the SES lesser the perceived stress levels.

In the current study, a low level of education was revealed to be a very significant predictor of greater stress. Although having a high degree of knowledge may also be stressful, it has been hypothesized that education helps people to become better at managing stress.[11] We also discovered greater PSS

Table 5. Difference in PSS scores across various sociodemographic variables and lifestyle habits. (Univariate analysis)

		N	Mean PSS	Std. Deviation	t	df	p-value
Alcoholism	Yes	4	24.500	3.0000	2.888	291	**0.004***
	No	289	16.076	5.8167			
Smoking	Yes	4	24.250	3.2016	2.798	291	**0.005***
	No	289	16.080	5.8206			
Marital Status	Married	271	16.244	6.0160	0.536	291	**0.05***
	Unmarried	22	15.545	3.5821			
		Sum of Squares	df	Mean Square	F	P value	
Occupation	Between Groups	416.676	6	69.446	2.061	**0.05****	
	Within Groups	9634.620	286	33.687			
Socio economic status	Between Groups	512.465	6	85.411	2.561	**0.02****	
	Within Groups	9538.832	286	33.353			

*t-test, ** ANOVA

Table 6. Regression analysis showing the various factors associated with PSS Scores

		Standardized Coefficients	t	p-value*	Adjusted R Square
		Beta			
	Gender	-0.066	-1.112	0.267	
	Age	-0.017	-0.282	0.778	
	Religion	-0.027	-0.474	0.636	
	Marital Status	-0.017	-0.282	0.778	
	Occupation	0.012	0.172	0.864	
PSS scores	Education	0.044	0.672	0.502	0.071
	SES	-0.172	2.312	**0.005**	
	Type of family	-0.068	-1.171	0.243	
	Alcoholism	0.125	1.435	0.152	
	Smoking	0.077	0.875	0.383	
	Hypertension	0.028	0.48	0.632	
	Diabetes Mellitus	0.095	1.589	0.113	

*Linear regression

scores among participants from the lower socioeconomic strata, which is consistent with the previous findings.[9–11]

It has been noted that unemployment or lack of employment means among individuals who aspire to work relates to greater perceived stress owing to the possibility of lack of financial independence.[10] However, in present analysis, those who are semiprofessionals noted greater perceived stress. This may be attributable to the high proportion of semiprofessionals in sample.

In current research, married individuals noted higher levels of prevalent stress than unmarried participants, despite the perception that marriage reduces perceived stress levels.[18] However, it may also be recognized that economic deprivation may contribute to the spread of stress inside relationships.[19]

Nevertheless, there are shortcomings in present study. First as it is cross-sectional research, it is unable to evaluate the temporal link between prevalent stress and the numerous stressor factors. Secondly, the analysis did not account for several characteristics, such as social isolation and neighborhood profile, which might impact the reported stress levels of community members.[11,14,20] Finally, analysis was done in a single Urban field practice area in Kolar, Karnataka which limits its external validity.

Conclusion

In conclusion, perceived stress among low socioeconomic status was high with habit of smoking, alcoholism, marital status, and occupation being its covariates. Future research should evaluate the significance of social networks in the Indian setting for dealing with perceived stress and should

design interventional studies at the community level to reduce the perceived stress levels among the general population.

References

1) Rosengren A, Hawken S, Ôunpuu S, Sliwa K, Zubaid M, Almahmeed WA, et al. Association of psychosocial risk factors with risk of acute myocardial infarction in 11 119 cases and 13 648 controls from 52 countries (the INTERHEART study): case-control study. *The Lancet*. 2004;364(9438):953–962. Available from: https://doi.org/10.1016/S0140-6736(04)17019-0.

2) Kivimäki M, Kawachi I. Work stress as a risk factor for cardiovascular disease. *Current Cardiology Reports*. 2015;17(74):1–9. Available from: https://doi.org/10.1007/s11886-015-0630-8.

3) Toussaint L, Shields GS, Dorn G, Slavich GM. Effects of lifetime stress exposure on mental and physical health in young adulthood: How stress degrades and forgiveness protects health. *Journal of Health Psychology*. 2014;21(6):1004–1014. Available from: https://doi.org/10.1177/1359105314544132.

4) Surwit RS, Schneider MS, Feinglos MN. Stress and Diabetes Mellitus. *Diabetes Care*. 1992;15(10):1413–1422. Available from: https://doi.org/10.2337/diacare.15.10.1413.

5) Isasi CR, Parrinello CM, Jung MM, Carnethon MR, Birnbaum-Weitzman O, Espinoza RA, et al. Psychosocial stress is associated with obesity and diet quality in Hispanic/Latino adults. *Annals of Epidemiology*. 2015;25(2):84–89. Available from: https://doi.org/10.1016/j.annepidem.2014.11.002.

6) Butler G. Definitions of stress. *Occasional paper (Royal College of General Practitioners)*. 1993;61:1–5. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2560943/pdf/.

7) Feizi A, Aliyari R, Roohafza H. Association of Perceived Stress with Stressful Life Events, Lifestyle and Sociodemographic Factors: A Large-Scale Community-Based Study Using Logistic Quantile Regression. *Computational and Mathematical Methods in Medicine*. 2012;2012:1–12. Available from: https://doi.org/10.1155/2012/151865.

8) Cohen S. Contrasting the Hassles Scale and the Perceived Stress Scale: Who's really measuring appraised stress? *American Psychologist*. 1986;41(6):716–718. Available from: https://doi.org/10.1037/0003-066X.41.6.716.

9) Carroll D, Smith GD, Sheffield D, Shipley MJ, Marmot MG. The relationship between socioeconomic status, hostility, and blood pressure reactions to mental stress in men: Data from the Whitehall II study. *Health Psychology*. 1997;16(2):131–136. Available from: https://doi.org/10.1037/0278-6133.16.2.131.

10) Sheldon C, Denise J. Who's Stressed? Distributions of Psychological Stress in the United States in Probability Samples from 1983, 2006, and 2009. *Journal of Applied Social Psychology*. 2012;42(6):1320–1334. Available from: https://doi.org/10.1111/j.1559-1816.2012.00900.x.

11) Nielsen L, Curtis T, Kristensen TS, Nielsen NR. What characterizes persons with high levels of perceived stress in Denmark? A national representative study. *Scandinavian Journal of Public Health*. 2008;36(4):369–379. Available from: https://doi.org/10.1177/1403494807088456.

12) Fone MR. Work Stress and Alcohol Use. *Alcohol Research & Health*. 1999;23(4):284–291. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6760381/pdf/arh-23-4-284.pdf.

13) Torres OV, O'Dell LE. Stress is a principal factor that promotes tobacco use in females. *Progress in Neuro-Psychopharmacology and Biological Psychiatry*. 2016;65:260–268. Available from: https://doi.org/10.1016/j.pnpbp.2015.04.005.

14) Elliott M. The stress process in neighborhood context. *Health & Place*. 2000;6(4):287–299. Available from: https://doi.org/10.1016/S1353-8292(00)00010-1.

15) Satheesh BC, Prithviraj R, Prakasam PS. A Study of Perceived Stress among Undergraduate Medical Students of a Private Medical College in Tamilnadu. *International Journal of Science and Research (IJSR)*. 2015;4(1):994–997. Available from: https://www.ijsr.net/archive/v4i1/SUB15255.pdf.

16) Walvekar SS, Ambekar JG, Devaranavadagi BB. Study on Serum Cortisol and Perceived Stress Scale in the Police Constables. *Journal of Clinical and Diagnostic Research*. 2015;9(2):BC10–BC14. Available from: https://doi.org/10.7860/JCDR/2015/12015.5576.

17) National Mental Health Programme (NMHP). . Available from: https://main.mohfw.gov.in/Major-Programmes/non-communicable-diseases-injury-trauma/National-Mental-Health-Programme-NMHP.

18) Beam CR, Dinescu D, Emery R, Turkheimer E. A Twin Study on Perceived Stress, Depressive Symptoms, and Marriage. *Journal of Health and Social Behavior*. 2017;58(1):37–53. Available from: https://doi.org/10.1177/0022146516688242.

19) Conger RD, Rueter MA, Jr GHE. Couple resilience to economic pressure. *Journal of Personality and Social Psychology*. 1999;76(1):54–71. Available from: https://doi.org/10.1037/0022-3514.76.1.54.

20) Mani G, Udayakumar S, Annamalai K, Ramasamy DJ. Perceived levels of stress and its correlates among residents of old age home in Kanchipuram District, Tamil Nadu. *Medical Journal of Dr DY Patil University*. 2014;7(6):728–731. Available from: https://doi.org/10.4103/0975-2870.144860.