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Perceived Stress, Anxiety And Psychological Response Of Dentist To Covid 19 Pandemic-An Observational Cross-Sectional Study

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Abstract :

Context: Covid-19 has caused deep impact on mental health of individuals so as dentists due to their nature of work. Hence, the aim of this study was to evaluate the level of perceived stress (PS), anxiety and psychological response of dentist during the COVID-19 crisis.

Material and Methods: An online google form survey was done on dentist working in India. A well-structured questionnaire was prepared which comprised of 4 sections 1- demographic details of participating dentist , 2- perceived stress scale 3- GADS Scale 4- psychological response to assess the level of Perceived stress, anxiety and psychological response of dentist working in India .

Statistical analysis Descriptive analysis, Chi square test, Student t test , linear regression analysis and Spearman's correlation test was applied and results were drawn .

Results: The mean score of PSS was 21.8781,SD 4.29667 and GADS mean score was14.6318, SD5.33878 .Female dentist had more perceived stress and anxiety as compared to male dentist. There was a statistically significant association between speciality and PSS, GADS and psychological response. A positive correlation was present between PSS, GADS and psychological response .

Conclusion: The dental key opinion leaders need to work with concerned authorities to develop certain policies and guidelines that provides a passable space for monitoring, screening, referral, and interventional care such that the stress level is minimized.

Key words : Perceived stress, anxiety , Covid-19 Pandemic

Background:

COVID-19 pandemic has created lot of challenges we have ever faced since world war II.The disease is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). SARS-CoV-2 spreads by human-to-human contact.[1] Airborne and direct contact contamination are the major infection pathways of Sars-CoV-2.[2] Airborne contamination is due to droplets released through exhalation, cough or sneeze, direct infection instead is due to contact with contaminated surfaces and eye, nose or mouth mucosa.[3] The distance and length of time that particles remain suspended in the air is determined by particle size, settling velocity, relative humidity, and air flow. Droplets that are >5 µm in diameter can spread up to 1 m. The nuclei of the droplets which have a diameter < 5 µm create an aerosol which has diffusion capacity greater than 1m.The outbreak hit Wuhan in late December 2019, when a large number of patients presented with pneumonia of unknown aetiology.[4]The incubation period of COVID-19 is reported to be about 5 to 6 days, with up to 14 days have been reported and this is widely used as cut off days for medical observation and quarantine.[5] COVID-19 clinical manifestations mainly include cough, fever and dyspnoeabut also anosmia, ageusia and, in few cases, diarrhoea have been reported.[6] Cutaneous manifestations have been observed :acral areas of erythema with vesicles or pustules (often after other symptoms) (19%), other vesicular eruptions (9%), urticarial lesions (19%), maculopapular eruptions (47%) and livedo or necrosis (6%) .[7]

Dentist, like other healthcare providers, may be exposed to COVID-19 as part of their work, as the virus can spread from person to person through small droplets from the nose or mouth .[8] In dental practice, the possible routes of transmission for COVID-19, or SARS-CoV-2, include airborne spread via aerosols formed during dental procedures[9], contact spread, and contaminated surfaces spread.[2] During this phase, dentist and dental staff has faced conflicts regarding their professional roles as health care providers versus their roles as family members. According to Maunder et al.2003 , the conflict of altruism and professional liability, on the one hand, with fear and blame for potentially endangering their relatives to a highly infectious agent, on the other hand, was a tremendous burden for many medical staff individuals during the severe acute respiratory syndrome (SARS) outbreak.[10]

In spite of following universal precautions, when a COVID-19 patient or a carrier is treated, the risk of aerosol induced spread of virus appears to higher, creating numerous hot-sites of virus deposition in the operatory.[11,12] Among dentists, there is a constant, looming anxiety of encountering a COVID19 infected patient especially when there is lack or limited of access to personal protective equipment, no proper standard protocol for management and possibility of incurring financial implications in the future due to decreased clinical operation hours.[13]

Catastrophic nature of the disease has a deep short term and long term psychological impact. In the present COVID19 crisis, a Chinese general population survey documented more than a third of the respondents manifested psychological stress with 5% experiencing severe distress.[14]Among Indians, in a small general public survey, 80 % of the respondents were preoccupied with the thoughts of COVID-19, while sleep difficulties (12.5%), paranoid about acquiring COVID-19 infection (37.8%) and distress (36.4%) were also reported. There was a perceived mental healthcare need in at least 80 %

of participants.[15]A study among Chinese HCW exposed to COVID-19 patients reported distress(75%), depression(50%), anxiety(45%), and insomnia(34%).[16] During the SARS COV pandemic, many of the health care workers were reluctant and left their jobs due to fear of infection spread.[17] Uncertainty during this period has led to stress, anxiety and depression among health care professionals .[18]

In summary, till now there are no studies assessing perceived stress, anxiety and psychological Response of Indian Dentist to Covid -19 Pandemic. The outcome of the present study will add to the body of knowledge in establishing recommendations for preparedness of dentist to combat such pandemic.

Thus the current study aimedto assess perceived stress, anxiety and psychological response of Indian Dentist to Covid -19 Pandemic and provide future recommendations to cope in such pandemics .

Objectives:

1- To assess perceived stress among dentist during Covid 19 pandemic.

2- To assess anxiety among dentist during Covid 19 pandemic.

3- To assess dentist psychological response to Covid 19 pandemic.

4- To assess influence of demographic characteristics on perceived stress, anxiety and Psychological response of dentist to COVID 19 Pandemic

5- To provide recommendations for preparedness of dentist to combat such pandemics**.**

Methods :

This observational cross -sectional study was done through Online survey. Google form online survey was used for data collection, convenience sampling (researcher themselves contacted the dentist to participate in the survey and snowball sampling (participating dentist were asked to forward the questionnaire to other dentist colleagues to achieve maximal participation. The questionnaire was distributed personally via a quick response (QR) code as well as posted on various social media platforms like Facebook and WhatsApp. Dentist consent to participate in the survey was taken prior to the start of survey. The duration of the study was kept 2 months.

Sample selection :

This study was done on dentist practicing in India. Considering a dentist population of 2.70000 in India , which becomes population size at 5 % level of significance and 95% of confidence interval the sample size obtained was 384. Attributing to incomplete responses or non-response to questionnaire we contacted 500 dentist personally to participate in the survey out of which a total of 402 participant completely filled the questionnaire with a response rate of 80.4%.

Research tools:

The main instrument of the study is questionnaire. Questions of the survey were developed after reviewing pertinent literature and the international guidelines. The questionnaire was designed in English and compromised of 4 sections: Questions on Sociodemographic Characteristics, PSS Scale to measure perceived stress of dentist, Gads7Scale to measure anxiety among dentist, Questions about dentists psychological response of dentist to Covid 19.

Statistical analysis:

Data collected was entered into spreadsheets and analysed using SPSS version 21.0 (IBM; Chicago). Descriptive analysis was presented in forms of mean and standard deviation. Step wise linear regression analysis was done to determine the influence of independent variables such as gender, qualification and specialisation on dependent variables of perceived stress scale, GADS and psychological response. Chi square test was used to determine any difference in proportion each variable within gender. Spearman's Correlation test was used to evaluate the correlation of Perceived Stress Scale with GADS scale, GADS with Psychological response and PSS with Psychological response. Student t test was used to analyse differences amongst gender for Perceived Stress Scale, GADS scale and Psychological response. A P value lesser than 0.05 was considered significant.

Results :

Socio-Demographic Characteristics:

The total no of participants who gave their consent for the questionnaire and participated in the survey were 402. Out of which maximum participants were females i.e., 64.7% **.**Majority of the survey respondents were BDS graduates about 67.2%**.**Based on the qualification of the participants 40% were general dentists, 5% were Orthodontists, 6% were Oral and Maxillofacial surgeon and Periodontists respectively, 20.4% were Pedodontics, 4% were Endodontists, 1% were Oral medicine and Radiologists and Public health dentists respectively, 8.7% were Prosthodontists and 8% were Oral pathologists **(Table 1)**

Mean Scores Of Perceived Stress Scale, Gads And Psychological Response Variables:

The overall mean scores of Perceived stress scale, GADS Scale and psychological response towards Covid-19 infection were 2.189 +0.422,2.090 +0.762, 2.618 +0.615 respectively **(Table 2).**

Association Between Demographic Variable And Percieved Stress Score

Linear regression analysis was run to predict the dependent variable of perceived stress scale on independent variables such as gender, qualification and speciality. The regression model statistically significantly predicts the outcome variable (i.e., it is a good fit for the data) for qualification (p =.002)and speciality at p = .003, but not for gender **(Table 3)**

Association Between Demographic Variable And Gads Score

Linear regression analysis was run to predict the dependent variable of GADS on independent variables such as gender, qualification and speciality. The regression model statistically significantly predicts the outcome variable (i.e., it is a good fit for the data) for speciality at p = .003, but not for gender and qualification **(Table 4)**

Association Between Demographic And Psychological Response

Linear regression analysis was run to predict the dependent variable of psychological response on independent variables such as gender, qualification and speciality. The regression model statistically significantly predicts the outcome variable (i.e., it is a good fit for the data) for speciality at p = .003, but not for gender and qualification **(Table 5)**

Relationship Between Perceived Stress And Psychological Response:

A spearman correlation test was run to determine the relationship between PSS and Psychological response. A positive correlation was noted, which was statistically highly significant (r = .281, n = 402, p <0.001**) **(Graph1)**

Relationship Between Perceived Stress And GADS:

A spearman correlation test was run to determine the relationship between PSS and GADS . A positive correlation was noted, which was statistically highly significant (r = .399, n = 402, p <0.001**)**(Graph2)**

Relationship Between GADS And Psychological Response:

A spearman correlation test was run to determine the relationship between PSS and Psychological response. A positive correlation was noted, which was statistically highly significant (r = .236, n = 402, p <0.001**) **(Graph3)**

Comparison Of Perceived Stress Scale Between Gender

Student t test was run to analyse differences amongst Perceived stress scale variable between gender. A significant difference was noted between gender for the variable at p <0.001. (**Table 6)**
Comparison Of GADS Between Gender

Student t test was run to analyse differences amongst GADS variable between gender. A significant difference was noted between gender for the variable at p <0.001. (**Table 7)**

Comparison Of Psychological Response Between Gender

Student t test was run to analyse differences amongst psychological response between gender. A significant difference was noted between gender for the variable at p <0.001. **(Table 8)**

Discussion :

The COVID-19 restrictions have caused serious disruption worldwide. This disruption extends from individuals to families, communities and to countries. This disruption also has altered previous familiar concepts and added complexities in all walks of life**.**[19,20] Mental health issues among health care worker in COVID-19 situation has been documented.[21]This amend mental health conditions emanate from several aspects of disturbances from daily routine. This includes social isolation, interpersonal distancing, heightened need for infection control procedures,fear of contagion, public perception of COVID-19 stigma, Concerns for self/family wellbeing, procedural errors, less availability to protection gears, poor quality of para-service provision, along with core issues of financial insecurity and potential loss of income.[22]Economic impact of Covid-19 pandemic has been observed at various levels like personal, community, national and global level. This burden cannot be underestimated, as it could potentially influence on all other spheres of life.[23]Dentists as an integral part of the society, are not immune from all these impacts.

The first section of the study comprised of questions on sociodemographic details like gender, qualification and specialization. In the current study majority of the participants were female (64.7%), maximum participants were undergraduates (67.2%) and under specialization majority were pedodontics (20.7%).There is dearth of evidence of perceived stress (PS) and distress among dentists, who are at the highest risk of cross infection.[24] **Ugo Consolo et.al**. had applied GADS Scale to assess psychological reactions of dental practitioners to COVID-19 in the Northern Italy Districts.[25]For this very purpose, we used two scales, a time-tested PSS scale and GADS 7 Scale on Indian dentist. Both have been used and published in peer reviewed literature and been validated and accepted scales. Taking into the account of current pandemic crisis the time frame of these scales was increased to last six months to get better review of stress and anxiety of each individual. There is ample amount of literature, classifying dentistry as a stressful job, reporting increased stress among dentists irrespective of Covid 19 scenario.[26] However, the COVID-19 outbreak and associated lockdown seem to have exaggerated the prevailing stress among dentists as percentage of dentists reported to perceive stressful situations during covid 19 Pandemic was found to be 95.5% in the present study**. Supriya et al.2020** in their study reported 79.24% dentist suffering from perceived stress from Chhattisgarh state of India. Similar results were reported in the study on Chinese health care workers[Lai et al., 2020] and physicians of Iraq [Abdullah et al.2020] who were exposed to COVID-19patients. [26,16, 27.]

Similarly, on comparing stress level of Indian orthopaedic surgeons ,trainee ophthalmologists during COVID-19 flare up, the level of stress that dentists in the present study were facing is much higher (22.5% in case of orthopaedic surgeons and 54.8% in trainee ophthalmologists).[26] Contradicting this **McAlonan et al. 2007**, reports 17 (5.7), which describes that health professionals at the moment of the outbreak, do not present higher levels of perceived stress. They stated that they had a higher level of threshold to stressful situations. Indian Women dentist reported to have experienced a higher extent of stress in the study by **(Qiu et al., 2020).** [14] Findings in this current survey point out higher levels of stress and anxiety in women dentist. The reasons for this finding may be related to sex differences in coping with stress. Women presenting higher scores of stress and anxiety, was already described by the initial author **Cohen et al. 2012**.[28] The reasons for this finding may be related to sex differences in coping with stress. Numerous studies, show how women report higher intensity of the symptoms than men, and displays gender and sensitivity to the depresso-genic effect of stressful life events, where women reported higher stress rates.[26]Women being more affiliative

and they have stronger involvement in house hold and family matters they tend to get more exposed to problems in the social network.[29]

Section three of the questionnaire assessed the presence of symptoms of anxiety by means of the Generalized Anxiety Disorder 7-item (GAD-7) scale ,which is commonly used to assess the presence of general anxiety symptoms across various populations and settings. The overall level of general anxiety in the current study can be considered as moderate (mean GAD-7 score was 14.6318, Sd = 5.33878. In the study by **Ugo Consolo et al. 2020** reported overall level of anxiety (mean score 6.56, SD = 4.48). Similar study by **Shacham, M** et al .2020 reported in Israel where elevated psychological distress was found in 11.5% of the sample.[30]

Section 4 of the questionnaire comprised questions on psychological response of dentist to

covid 19 situation which also included questions regarding perception of our professional

future. A pandemic often brings economic recession, and this is what happened during Covid

19 pandemic 2020. This pandemic had impact on every aspect of our global economy. Owing to the measures enacted to stop the spread of this pandemic, such as large-scale quarantines, travel restrictions, and social-distancing measurewas a sharp decrease in consumer and business spending capacity until the end of 2020 and part of 2021 . This ultimately lead to a global recession. This situation is challenging for dentistry, and the financial impact leading to mental health issues will be experienced in both the short and long-term.

Conclusion :

This phenomenon of increased perceived stress during COVID-19 outbreak would be ephemeral which may subside when the situation dampens or when dentists learn and adapt to the situation. Stress can never be totally eliminated but can be minimized to some extent by various distraction methods or participation in stress management courses, seminars, and educational programs. However, if this distress is in excess, or persists even after COVID-19 flattens, it might lead to unwanted patho-physiological consequences on a person's health, which would need professional help. Dentist suffering from mental health issues should be carefully screened to identify and treat evolving mental disorders. The Indian dental association and higher authorities should develop certain policies and guidelines for monitoring, screening, referral, and interventional care for minimising stress.

Future recommendations:

Future suggestion would be to lay down proper guidelines for infection control protocols during such pandemics by respective authorities like WHO, CDC , Ministry of health and Indian dental association. And also to make dentist aware of such pandemic situations so that in future they are able to cope during such stressful situation and can manage their practice following proper protocols. Dental professionals should be encouraged to attend workshops on stress management. Emphasis on self-relaxation training, regular exercise and healthy lifestyle should be given. Evidence-based psychosocial interventions and support for short-term psychological problems, such as stress

and anxiety at the early stage of the pandemic are necessary. Moreover, self-relaxation training, regular exercise and healthy lifestyle should be emphasised.

Limitations and generalisability :

This study has several limitations. This was an online survey so the sample may not be a well representation of entire population. Another limitation is that the results were based on self-reported questionnaires that investigated psychological problems, which might be different from clinical diagnostic interviews. The causal relationships should be interpreted with caution.

Although a relatively large number of dentist from India participated in this study still more studies are needed to explore the longitudinal trajectories of perceived stress and anxiety during such pandemic situations in India.

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Tables

Table 1: Demographic profile of Dental Surgeons (N=402)

Qualification	Number (N=402)	Percentage %
Undergraduate	**270**	**67.2**

Post graduate	**132**	**32.8**
Gender		
Male	**142**	**35.3**
Female	**260**	**64.7**
Specialization		
General dentist	161	40.0
Orthodontist	20	5.0
Oral and maxillofacial surgeon	24	6.0
Periodontist	82	20.4
Pedodontist	16	4.0
Oral medicine& radiology	4	1.0
Public health dentist	4	1.0
Prosthodontist	35	8.7
Oral pathologist	32	8.0

Table 2:Mean scores of Perceived Stress Scale, GADS and Psychological responsevariables:

Variables	Mean+S.D	Minimum	Maximum
PerceivedStress Scale	2.189±.422	.80	4.00
GADSscale	2.090±.762	1.00	4.00
Psychological response	2.618±.615	1.00	3.86

Table3: Association ofPerceivedstressscalewithparticipantsgender,educationand specialtyscores using multiple linearregression analysis

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std.Error	Beta		
(Constant)	1.806	.113		15.923	.000
Gender	.144	.045	.163	3.161	.002
Qualification	.227	.055	.253	4.123	.000
Speciality	-.058	.013	-.268	-4.612	.000

Table 4 :Association of GADSscalewithparticipantsgender,educationandspecialty scoresusing multiple linearregression analysis

DependentVariable:GADSScale

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std.Error	Beta		
(Constant)	2.110	.205		10.306	.000

Gender	.183	.082	.115	2.231	.026
Qualification	-.105	.099	-.065	-1.059	.290
Specialty	-.068	.023	-.175	-2.998	.003

Table 5 : Association of psychologicalresponsewithparticipantsgender,educationandspecialtyscoresusingmultiplelinearregressionanalysis

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std.Error	Beta		
(Constant)	2.621	.169		15.507	.000
Gender	.034	.068	.026	.498	.618
Qualification	.070	.082	.053	.850	.396
Specialty	-.056	.019	-.180	-3.014	.003

a.DependentVariable:Psychologicalresponse

Table6: ComparisonofPerceivedStressScalebetweengender

PSS withgender						
	t	**df**	**Sig.(2-tailed)**	**MeanDifference**	**95%ConfidenceIntervalofthe Difference**	
					Lower	**Upper**
	103.895	401	.000	2.18955	2.1481	2.2310

Table7:ComparisonofGADS betweengender

GADS withgender	t	df	Sig.(2-tailed)	MeanDifference	95%ConfidenceIntervaloftheDifference	
					Lower	Upper
	54.950	401	.000	2.09026	2.0155	2.1650

Table8:ComparisonofPsychologicalresponsebetweengender

Psychological Responsewithgender	t	df	Sig.(2-tailed)	MeanDifference	95%ConfidenceIntervaloftheDifference	
					Lower	Upper
	85.320	401	.000	2.61869	2.5584	2.6790

Figures

Figure 1: Scatter plot depicting correlation of Perceived stress scale with psychologicalresponse

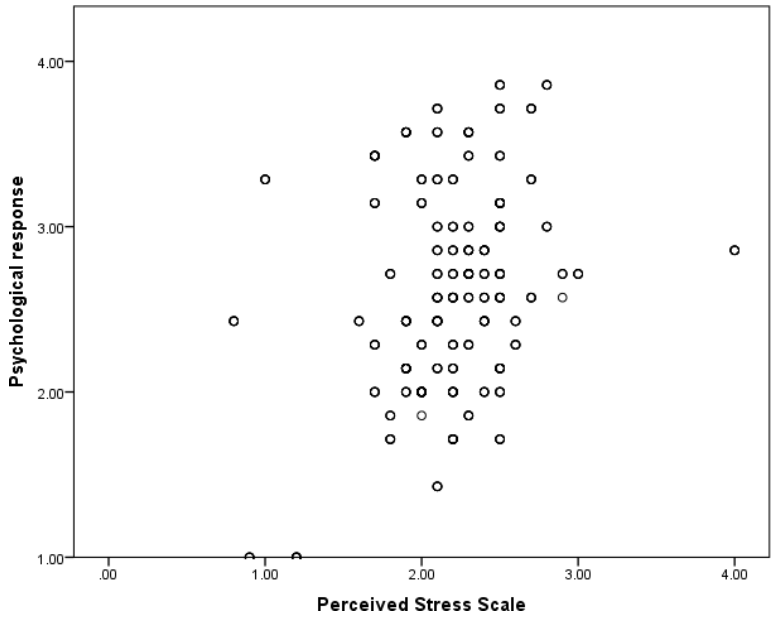


FIGURE 2:Scatterplot depictingcorrelationof PSSwithGADS

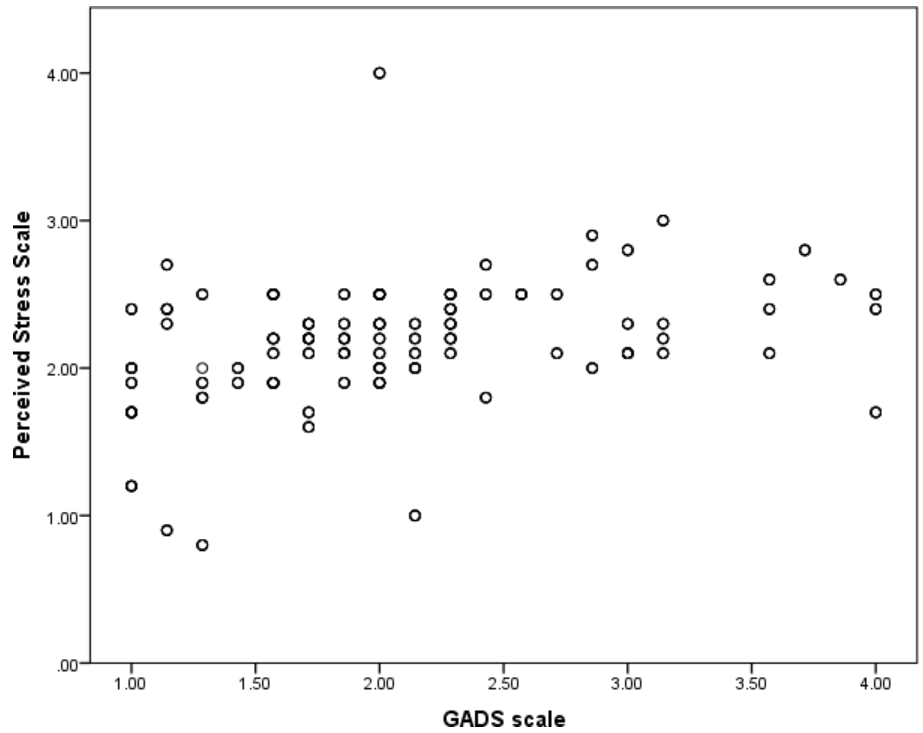
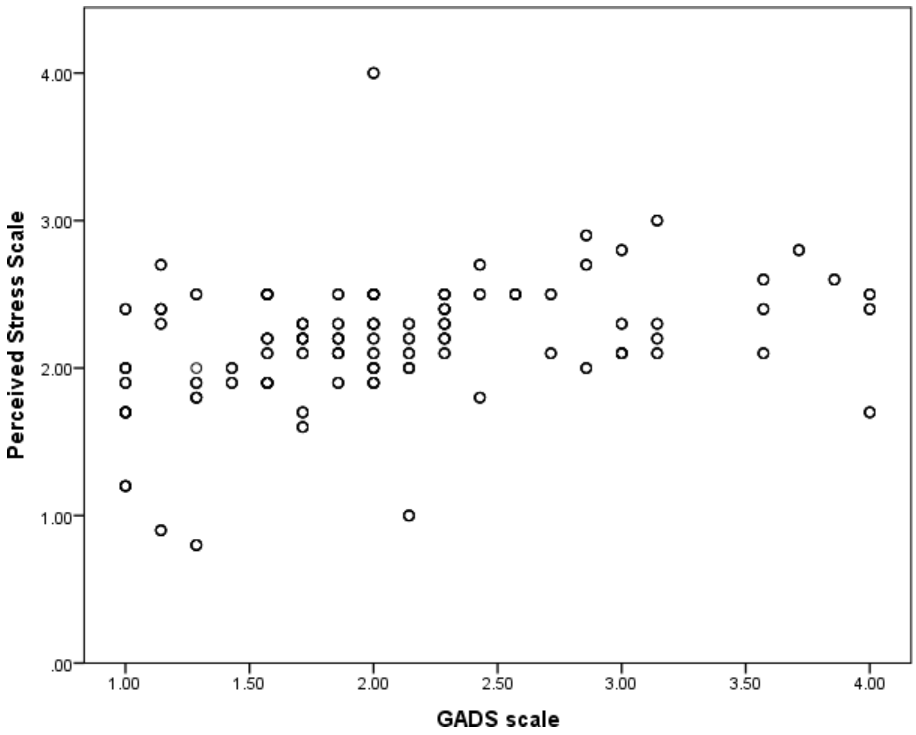


Figure 3: Scatterplot depictingcorrelationof PSSwithGADS


Perceived Stress Scale
4.00
3.00
2.00
1.00
.00
1.00
1.50
2.00
2.50
3.00
3.50
4.00
GADS scale