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Original Article

Relationship of Periodontal Health and Multiple Common Stress Factors Among The Socially Deprived Women

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ABSTRACT

Periodontitis is a prevalent chronic inflammatory disease in developing countries which may impose multiple negative impacts on the quality of life. The possible role of psychosocial factors in the aetiology of inflammatory periodontal diseases needs further investions to establish the fact. **Objective:** To evaluate the general periodontal health and the relationship of periodontal inflammation with multiple common stress factors among the socially deprived and separated women residing in a shelter home of Multan city. **Methods:** This group comparative study was spanned over one month. Through purposive sampling, a cohort of 115 women aged 20-40 years, residing in the SOS village shelter home, Multan for more than a month were included. Women were divided into Cases (with stress) and Controls (without stress) and were matched for age and educational status. Periodontal examination was done employing Community Periodontal Index while Life Events Scale was used to assess the type of stress. A structured and validated questionnaire was used to record the readings. Descriptive statistical measures including mean and frequency percentages along with Logistic regression analysis were used employiong SPSS version 21. **Results:** Significant relationship ($p<0.001$) was found between periodontal disease and self-health-related stress, financial stress and family health-related stress. Logistic regression analysis revealed that subjects who felt self-health-related stress are 0.016, financial stress are 0.125 and family health-related stress are 0.207 times more prone to have periodontal disease than those who never or rarely felt such stresses. **Conclusion:** Self-health-related stress, financial stress and family health-related stress are the potential risk indicators for the development of periodontal disease among socially deprived women.

INTRODUCTION

Periodontitis is a prevalent chronic inflammatory disease which may impose multiple negative impacts on the quality of life [1, 2]. It is a multifactorial disease and entails the phases of aggravation combined with episodes of diminution. It represents a confined infectious load that starts indigenous inflammation and tissue damage [3]. Experimental evidence suggested bacterial plaque deposits as the primary factor initiating periodontitis [4, 5]. Several risks and susceptibilities have been associated with periodontitis, like systemic diseases, socio-economic or educational status, tobacco smoking and psychological stress [6, 7]. Genetic, dermatological, haematological, granulomatous, immunosuppressive, and neoplastic disorders can also have periodontal manifestations [8, 9]. Reviewing the literature concerning the possible role of psychosocial factors in the aetiology of inflammatory periodontal diseases, there is strong evidence that emotional stress is one of the predisposing factor to gingivitis [10, 11]. Several stress markers are found in blood and saliva of patients with periodontal diseases and

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influence the development of periodontal diseases by several mechanisms including modifications of the inflammatory response and changes in the composition of the dental biofilm [12, 13]. Stress is usually compatible to survive with the encounters of daily life. Complications initiate when the stress reaction is incompatible with the severity of challenge. Psychosomatic stress can down control the cellular immune reaction [14]. When matched with the subjects who are not depressed, both medically compromised and medically well people with severe depression were revealed to have all prime features of inflammation with high inflammatory mediators like prostaglandins, significant inflammatory cytokines and all the solvable receptors in peripheral blood and cerebrospinal fluid [15]. Relationship between stress and poor periodontal condition has been well established by several studies in Western countries [16-18]. However, very limited data is available to support this relation in South East Asia. Most of the previous studies have assessed the relation of academic stress, stress related to self health and job stress with periodontal inflammation [14, 17]. Whereas, the periodontal status of individuals suffering from other stresses such as emotional stress due to academic issuses, family problems, financial stress, stress de to marital issues is as yet unknown. Therefore, this study was envisioned to evaluate the general periodontal health and the relationship of periodontal inflammation with multiple common stress factors among the socially deprived and separated women residing in a shelter home of Multan city.

METHODS

This group comparative study was spanned over one month (February-March 2021).The study sample consisted of a cohort of women aged 20-40 years. Through non-probability, conveinient and purposive sampling, out of a total of 380 women, 115 women who were residing in the trust for more than a month were approached at SOS village welfare trust/ shelter home, Multan. Permission to conduct the study was obtained from the Official Ethical & Review Board of Multan Medical & Dental College, Multan under MDC No. 0013 (parent institution of the research). Permission was also taken from the trust administration. The official visit day was informed to the participants beforehands on which informed consents were priorly obtained. Participants with all possible confounders for periodontal disease, including systemic diseases, any prosthesis in oral cavity, lack of any of the index teeth and all subjects who did not gave consent were disqualified from the present study. Nominated subjects were questioned employing a structured and validated questionnaire for evaluating periodontal condition and stress factors. Subjects were made sure about the information taken from them will be kept confidential and therefore, they must be honest to all answers. From the final sample (n=115) all the subjects completed the periodontal clinical examination and answered the questionnaire. Based on this, a total of 58 sujects revealed the presence of any of the given stress and therefore fell into the category of stress group and were considered "Cases"; the other 57 subjects responded no stress condition and were considered healthy with no stress "Control". Cases and Controls were particularly matched for age and educational status. For this purpose females were further divided into sub-groups, 20-30 and 31-40 years and under graduates and graduates. Periodontal inspection was lead by a competent inspector following all cross infection protocols using mobile dental units. Sterilized instruments were used to execute the examination. Community Periodontal Index (CPI) was employed as basic examination tool. Life Events Scale was used to assess the type of stress from which the subjects were suffering. Later on 10% of the study population intra-examiner reliability of the inspecter was also measured. Descriptive statistical measures including mean and frequency percentages were calculated to describe the distribution of replies against all study variables. Logistic regression analysis was also used employiong SPSS version 21.0. Intra-examiner reliability was measured by Cohen's Kappa. Any value having $p<0.05$ was said to be statistically significant at 95% confidence interval.

RESULTS

The mean age of the women identified was of 27 ± 6.84 years. The intra-examiner reliability (mean Kappa value) was found to be 0.95. Table 1 reveals the responses of the study participants in percentages against all study variables. Mainstream of participants (n=82) were between 20-30 years and most of them (n=101) were undergraduates. Stress due to financial reasons was the most commonly identified stress (n=27) however, self health stress was least found (n=12) amoung the study subjects. Almost 52% (n=60) subjects were identified to have healthy periodontium while, around 28% and 19% had bleeding and calculus respectively.

Variables	Options	Cases (N=58)	Controls (N=57)	Total
Age	20-30 Years	42	40	82
	31-40 Years	16	17	33
Educational Status	Under Graduate	52	49	101
	Graduate	6	8	14
Stress Type	No Stress	-	57	57
	Self Health Stress	12	-	12
	Financial Stress	27	-	27
	Job Stress	00	-	00

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	Stress Related To Family Care	05	-	05
	Family Health Related Stress	00	-	00
	Stress Related To Parenting	00	-	00
	Stress Related To Neighbor Hood	00	-	00
	Stress Related To Other Factors	14	-	14
Periodontal Status	Healthy	37	23	60
	Bleeding	21	12	33
	Calculus	13	09	22

Table 1: Descriptive Results of Study Population

The results of logistic regression analysis indicative of association of stress with periodontal condition and resultant odds ratio. Significant associations were found between periodontal disease and financial stress ($p<0.001$), periodontal disease and self-health-related stress ($p<0.001$) and periodontal disease and stress related to family care ($p<0.001$). It has also been revealed that subjects who felt self-health-related stress are 0.016 times more likely to develop periodontal disease whereas, subjects who reported financial and stress related to family care are 0.125 and 0.207 times more prone to have periodontal disease respectively than those who never or seldom felt such stresses (Table 2).

Stress Factors	p-value	Odds Ratio (95% Ci)
Self Health Stress	0.001	0.016
Stress Related To Family Care	0.001	0.207
Financial Stress	0.001	0.125

Table 2: Logistic regression analysis demonstrating association of stress with periodontal condition and corresponding odds ratio

DISCUSSION

This study has reported the periodontal status of the socially deprived and separated women and the relationship of periodontal inflammation with different stress factors. To date, there is no data which has assessed this association among the underprivileged women population. This entails that, it was high time to work on this endeavor and reveal the consequences induced by emotional stress on periodontal health. In the present study, nearly half (49.6%) of the study subjects responded no stress condition whereas, the rest (50.4%) reported different types of stresses from which they were suffering. Stress due to financial reasons was the most commonly identified stress, however, self health stress was least found among the study subjects. These finding are in contrast to the previous literature which reported the presence of job stress as commonest felt stress, followed by self and family health related stress. Financial was least found among the study subjects, suggesting a better financial stability and health concioussness in Japan as compare to our part of the world [19]. In the present study, almost 52% subjects were revealed to have healthy periodontium while, around 28% and 19% had bleeding and calculus respectively. This suggests that subjects with no stress showed no periodontal disease while those with different stresses showed diseased periodintium on clinical examination. Similarly, current study reported significant statistical associations ($p<0.001$) between periodontal disease and financial stress, self-health-related stress and stress related to family care. These clinical and statistical findings clearly indicate a strong association of stress with periodontal pathologies. These findings of the present study are similar to many previously reported by Shah *et al.*, and Talib which determined that subjects with stress were additionally prone to periodontal pathologies than those who under no circumstances or only seldom felt the stress [19, 20]. Likewise, high occurrence of periodontal disease was seen in subjects who sensed job stress than those without such stress [18]. Another similar study by Akcali stated that "Chronic stress has a negative impact on the occurrence, development, and response to the treatment of periodontal disease via indirect actions on the periodontium" [12]. Few other studies testified that increase plaque depositions and poor gingival status was present in the students with psychological problems and different stressses in comparision to their controls [21, 22]. Direct relationship between different types of stresses in our society and many oral pathologies including periodontal disease still needs to be discovered.

CONCLUSIONS

Self-health-related stress, financial stress and family health-related stress are the potential risk indicators for the development of periodontal disease among socially deprived women. Stress reduction interventional measures may be recommended to prevent and control the increasing trend of periodontal disease.

Conflicts of Interest

The authors declare no conflict of interest

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Stressful Lifestyle And Periodontal Health; A Group Comparative Study

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Stressful Lifestyle And Periodontal Health; A Group Comparative Study

ABSTRACT:

Background: Periodontitis is a prevalent chronic inflammatory disease in developing countries which may impose multiple negative impacts on the quality of life. The possible role of psychosocial factors in the aetiology of inflammatory periodontal diseases needs further investions to establish the fact. This study was envisioned to evaluate the general periodontal health and the relationship of periodontal inflammation with multiple common stress factors among the socially deprived and separated women residing in a shelter home of Multan city.

Material and Methods: This group comparative study was spanned over one month. Through non-probability purposive sampling, a cohort of women aged 20-40 years, residing in the trust for more than a month at SOS village welfare trust/ shelter home, Multan. Women were divided into two groups (Cases and Controls) and were matched for age and educational status. Periodontal examination was done employing Community Periodontal Index while Life Events Scale was used to assess the type of stress. A structured and validated questionnaire was used to record the readings.

Results: Significant relationship (P<0.001) was found between periodontal disease and self-health-related stress, financial stress and family health-related stress. Logistic regression analysis revealed that subjects who felt self-health-related stress are 0.016, financial stress are 0.125 and family health-related stress are 0.207 times more prone to have periodontal disease than those who never or rarely felt such stresses.

Conclusion: Self-health-related stress, financial stress and family health-related stress are the potential risk indicators for the development of periodontal disease among socially deprived women.

Key Words: Stress, Periodontal disease, Deprived women

INTRODUCTION:

Periodontitis is a prevalent chronic inflammatory disease which may impose multiple negative impacts on the quality of life.[1,2] It is a multifactorial disease and entails the phases of aggravation combined with episodes of diminution. It represents a confined infectious load that starts indigenous inflammation and tissue damage.[3] Experimental evidence suggested bacterial plaque deposits as the primary factor initiating periodontitis.[4,5]

Several risks and susceptibilities have been associated with periodontitis, like systemic diseases, socio-economic or educational status, tobacco smoking and psychological stress.[6,7] Genetic, dermatological, haematological, granulomatous, immunosuppressive, and neoplastic disorders can also have periodontal manifestations.[8,9] Reviewing the literature concerning the possible role of psychosocial factors in the aetiology of inflammatory periodontal diseases, there is strong evidence that emotional stress is one of the predisposing factor to gingivitis.[10,11] Several stress markers are found in blood and saliva of patients with periodontal diseases and influence the development of periodontal diseases by several mechanisms including modifications of the inflammatory response and changes in the composition of the dental biofilm.[12,13]

Stress is usually compatible to survive with the encounters of daily life. Complications initiate when the stress reaction is incompatible with the severity of challenge. Psychosomatic stress can down control the cellular immune reaction.[14] When matched with the subjects who are not depressed, both medically compromised and medically well people with severe depression were

revealed to have all prime features of inflammation with high inflammatory mediators like prostaglandins, significant inflammatory cytokines and all the solvable receptors in peripheral blood and cerebrospinal fluid.[15]

Relationship between stress and poor periodontal condition has been well established by several studies in Western countries.[16-18] However, very limited data is available to support this relation in South East Asia. Most of the previous studies have assessed the relation of academic stress, stress related to self health and job stress with periodontal inflammation1[14, 17]. Whereas, the periodontal status of individuals suffering from other stresses such as emotional stress due to academic issuses, family problems, financial stress, stress de to marital issues is as yet unknown. Therefore, this study was envisioned to evaluate the general periodontal health and the relationship of periodontal inflammation with multiple common stress factors among the socially deprived and separated women residing in a shelter home of Multan city.

METHODOLOGY:

This group comparative study was spanned over one month (February-March 2021).The study sample consisted of a cohort of women aged 20-40 years. Through non-probability purposive sampling, women residing in the trust for more than a month were convieniently approached at SOS village welfare trust/ shelter home, Multan.

Permission to conduct the study was obtained from the Official Ethical & Review Board of Multan Medical & Dental College, Multan under MDC No. 0013 (parent institution of the research). Permission was also taken from the trust administration. The official visit day was informed to the participants beforehands on which informed consents were priorly obtained. Participants with all possible confounders for periodontal disease, including systemic diseases, any prosthesis in oral cavity, lack of any of the index teeth and all subjects who did not gave consent were disqualified from the present study.

Nominated subjects were questioned employing a structured and validated questionnaire for evaluating periodontal condition and stress factors. Subjects were made sure about the information taken from them will be kept confidential and therefore, they must be honest to all answers. Based on the presence or absence of stress factors, women were later divided into two groups (Cases and Controls) and were particularly matched for age and educational status.

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was used to assess the type of stress from which the subjects were suffering. Later on 10% of the study population intra-examiner reliability of the inspecter was also measured.

Descriptive statistical measures including mean and frequency percentages were calculated to describe the distribution of replies against all study variables. Logistic regression analysis was also used employiong SPSS version 21. Intra-examiner reliability was measured by Cohen's Kappa. Any value having $P<0.05$ was said to be statistically significant at 95% confidence interval.

RESULTS:

The final sample was comprised of 115 subjects who completed the periodontal clinical examination and answered the questionnaire. Based on this, a total of 58 sujects revealed the presence of any of the given stress and therefore fell into the category of stress group and were considered "Cases"; the other 57 subjects responded no stress condition and were considered healthy with no stress "Control".

The mean age identified was of 27 ± 6.84 years. The intra-examiner reliability (mean Kappa value) was found to be 0.95. Table 1 reveals the responses of the study participants in percentages against all study variables. Mainstream of participants (n=82) were between 16-30 years and most of them (n=101) were undergraduates.

Stress due to financial reasons was the most commonly identified stress (n=27) however, self health stress was least found (n=12) amoung the study subjects. Almost 52% (n=60) subjects were identified to have healthy periodontium while, around 28% and 19% had bleeding and calculus respectively.

Table 2 presents the results of logistic regression analysis indicative of association of stress with periodontal condition and resultant odds ratio. Significant associations were found between periodontal disease and financial stress (P<0.001), periodontal disease and self-health-related stress (P<0.001) and periodontal disease and stress related to family care (P<0.001). It has also been revealed that subjects who felt self-health-related stress are 0.016 times more likely to develop periodontal disease whereas, subjects who reported financial and stress related to family care are 0.125 and 0.207 times more prone to have periodontal disease respectively than those who never or seldom felt such stresses.

Table 1: Descriptive Results of Study Population

VARIABLES	OPTIONS	FREQUENCIES	PERCENTAGES
AGE	16-30 years	82	71.3
	31-50 years	33	28.7
EDUCATIONAL STATUS	Under Graduate	101	87.8
	Graduate	14	12.2
STRESS TYPE	No stress	57	49.6
	Self health stress	12	10.4
	Financial stress	27	23.5
	Job stress	00	00
	Stress related to family care	05	4.3
	Family health related stress	00	00
	Stress related to parenting	00	00

	Stress related to neighbor hood	00	00
	Stress related to other factors	14	12.2
PERIODONTAL STATUS	Healthy	60	52.2
	Bleeding	33	28.7
	Calculus	22	19.1

Table 2: Logistic regression analysis demonstrating association of stress with periodontal condition and corresponding odds ratio

STRESS FACTORS	P-VALUE	ODDS RATIO (95% CI)
Self Health Stress	0.001	0.016
Stress Related to Family Care	0.001	0.207
Financial Stress	0.001	0.125

DISCUSSION:

This study has reported the periodontal status of the socially deprived and separated women and the relationship of periodontal inflammation with different stress factors. To date, there is no data which has assessed this association among the underprivileged women population. This entails that, it was high time to work on this endeavor and reveal the consequences induced by emotional stress on periodontal health.

In the present study, nearly half (49.6%) of the study subjects responded no stress condition whereas, the rest (50.4%) reported different types of stresses from which they were suffering. Stress due to financial reasons was the most commonly identified stress, however, self health stress was least found among the study subjects. These finding are in contrast to the previous literature.[19] which reported the presence of job stress as commonest felt stress, followed by self and family health related stress. Financial was least found among the study subjects, suggesting a better financial stability and health conciousness in Japan as compare to our part of the world.

In the present study, almost 52% subjects were revealed to have healthy periodontium while, around 28% and 19% had bleeding and calculus respectively. This suggests that subjects with no stress showed no periodontal disease while those with different stresses showed diseased periodintium on clinical examination. Similarly, current study reported significant statistical associations ($P<0.001$) between periodontal disease and financial stress, self-health-related stress and stress related to family care. These clinical and statistical findings clearly indicate a strong association of stress with periodontal pathologies.

These findings of the present study are similar to many previously reported researches which determined that subjects with stress were additionally prone to periodontal pathologies than those who under no circumstances or only seldom felt the stress.[19] Likewwise, high occurrence of periodontal disease was seen in subjects who sensed job stress than those without such stress.[18] Another similar study stated that "Chronic stress has a negative impact on the occurrence, development, and response to the treatment of periodontal disease via indirect actions on the periodontium".[12] Few other studies testified that increase plaque depositions and poor gingival status was present in the students with psychological problems and different stressses in comparision to their controls.[21,22]

Direct relationship between different types of stresses in our society and many oral pathologies including periodontal disease still needs to be discovered. This paradigm of research has been overlooked for many years may be because of the inability of this objective to be testified on animals and may be also due to the difficulty in measuring the extent and interval of stress. Therefore, it is recommended to carry out further researches to identify these unexplored facts so that the general population particulary under privileged and compromised women may be treated in accordance.

CONCLUSION: Self-health-related stress, financial stress and family health-related stress are the potential risk indicators for the development of periodontal disease among socially deprived women. Stress reduction interventional measures may be recommended to prevent and control the increasing trend of periodontal disease.

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Provide confidence intervals or p-values to quantify the significance of their findings.
Discuss simplifications made in the model and how they affected the results.
Describe the characteristics of the dataset, such as the size, distribution, and quality of the data.

Recommendations:

- ☐ *Accept as it is*
- ☒ *Accept with minor Revision*
- ☐ *Accept with major Revision*
- ☐ *Reject*

Signature with Stamp

PAKISTAN JOURNAL OF HEALTH SCIENCES

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Reviewer's Report Form

Title of Paper: Relationship of Periodontal Health and Multiple Common Stress Factors Among The Socially Deprived Women

Volume: ___4_____ Issue: ____1_____ Paper ID: 456

Reviewer's Name: Sana Hassan Designation: Deputy Director

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Context (*Please Check Mark (X) in the Relevant Cell*):

Rate the Following	*Excellent*	*Good*	*Fair*	*Poor*	*N/A*
Originality	☒	☐	☐	☐	☐
Brevity and focus	☒	☐	☐	☐	☐
Evaluation of analyses	☒	☐	☐	☐	☐
Interpretation of results	☒	☐	☐	☐	☐
Writing style	☒	☐	☐	☐	☐
Ethical Considerations	☒	☐	☐	☐	☐
References	☐	☒	☐	☐	☐
Accuracy	☐	☒	☐	☐	☐
Language	☐	☒	☐	☐	☐
Plagiarism Found	☐	☒	☐	☐	☐

Overall Comments

MINOR REVISION
Provide more details about the computational resources required for their experiments
Discuss howtheir findings influenced the development of new algorithms or approaches in their field.

Recommendations:

- ☐ *Accept as it is*
- ☒ *Accept with minor Revision*
- ☐ *Accept with major Revision*
- ☐ *Reject*

Signature with Stamp