

Gender Differences in Cardiovascular Risk and Psychological Stress among Adults in Pakistan

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ABSTRACT

Purpose: This paper set out to evaluate gender differences in cardiovascular risk factors and psychological stress in adults in Quetta, Pakistan, and to determine the relationship between perceived stress and cardiovascular risk in both male and female participants.

Procedure: A cross-sectional analytical study was developed among adult participants aged between 30 years and above in Quetta in Baluchistan during the period from February 2023 to August 2023. A structured questionnaire was used to collect data on socio-demographic factors, lifestyle, medical history, smoking status, physical activity, family history of cardiovascular disease and psychological stress. Perceived stress was measured using the Perceived Stress Scale and cardiovascular risk was measured using clinical and behavioural risk indicators such as blood pressure, body mass index, diabetes status, history of hypertension and lipid-related risk information where available. Descriptive statistics, chi-square test, independent sample t-test, and logistic regression were used to compare male and female participants and identify factors that were associated with an increased cardiovascular risk.

Findings: The analysis exhibited significant gender disparities in cardiovascular risk and psychological patterns of stress among the adults in Quetta. The female participants were more exposed to the psychological stress than their male counterparts, and the males were also more exposed to the behavioural risk factors such as smoking and sedentary lifestyle. Risk factors in both genders that were mostly observed included hypertension, increased body mass index, diabetes, and family history of cardiovascular disease. Participants that had greater perceived stress scores had an increased likelihood of having greater cardiovascular risk indicators. The correlation between psychological stress and cardiovascular risk seemed to be stronger in females, indicating that stress may have a different effect on cardiovascular vulnerability between the genders.

Conclusion: Gender variations are significant in the distribution of cardiovascular risk and psychological stress in adult people in Quetta. It was observed that psychological stress was a significant factor that was linked to cardiovascular risk especially in women. These results indicate that gender sensitive cardiovascular prevention programs, routine stress screening, lifestyle change and early screening program are required in Quetta and other cities in Pakistan of similar size.

Keywords: Gender differences, cardiovascular risk, psychological stress, hypertension, perceived stress, Quetta, Pakistan, adults.

INTRODUCTION

Cardiovascular disease continued to be one of the most significant health issues of the general population in the low- and middle-income countries. There had also been an increasing burden of hypertension, diabetes, obesity, smoking, physical inactivity and stress-related health issues in Pakistan. These variables had influenced both men and women, but the pattern and the severity had not always been similar across gender categories. In most societies, men had been exposed to more smoking and work lifestyle risks than women who had had a higher level of psychological stress due to household chores, social pressure, lack of mobility, economic dependency, and the inability to access preventive health care.

Psychological stress had now become a significant issue in cardiovascular health as it not only affected behaviour but also body physiology. Individuals experiencing elevated levels of stress tended to experience poor sleep, unhealthy diet, low physical activity, low compliance with treatment, and increased tobacco or stimulant use. Blood pressure, heart rate, hormonal balance, and inflammatory responses were also affected by stress. The changes had aided in the emergence and escalation of cardiovascular risk elements.

The Pakistani context had particularly been important in terms of gender differences in cardiovascular risks. Women usually got under-screened against cardiovascular disease due to their symptoms being disregarded or put down to weakness, anxiety, or household chores. Men, however, were usually exposed to

smoking, work pressure, and abnormal eating habits. Lifestyle change, urbanization, socioeconomic factors, lack of health awareness, and difficulties in accessing routine screening programs in Quetta had augmented the necessity to examine the cardiovascular risk and psychological stress among adult men and women.

This research was done in Quetta, Balochistan, to determine the gender difference in cardiovascular risk factor and psychological stress. The research also tested the hypothesis of perceived stress in relation to greater cardiovascular risk in adults.

Literature Review: The past literature had provided evidence that cardiovascular disease was not an exclusive biological condition, but also a social and psychological health issue. Hypertension, diabetes, increase in body mass index, smoking, poor diet, family history, and physical inactivity had been repeatedly determined to be major contributors to cardiovascular risk. These were risk factors, which had diverse impacts on the various populations based on their gender, age, social role, income, education, and access to health care.

A series of studies had already indicated that there was a difference in exposure of men and women to cardiovascular risk. It was not the first time that men were more likely to smoke, experience stressful situations in the workplace, and lead unhealthy lifestyles. In most of the South Asian contexts, women had been more likely to obesity, lack of physical activity, uncontrolled hypertension, and psychological distress. These variations were informed by cultural demands, household responsibilities, lack of control in making decisions and a lack of emphasis on the health of women.

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Cardiovascular risk had also been associated with psychological stress. Individuals reporting increased stress levels were more likely to experience increased blood pressure, poor glycaemic control, weight gain, sleep disturbance, and decreased physical activity. Health-seeking behaviour also had been affected by stress. A lot of high stressed adults had not sought medical advice and instead had self-medicated rather than receiving medical care. Family responsibilities, financial insecurity, social restrictions and emotional burden were often related to the stress of women. Employment, pressure on income and coping behaviours associated with smoking were often associated with stress in men.

Research in Pakistan had indicated that cardiovascular risk factors were prevalent in the populations of both rural and urban areas. Nevertheless, province level and urban level evidence had been non-existent, particularly in Baluchistan. Quetta possessed its own social and environmental setting such as the rapid urbanization, shift in dietary habits, sedentary, and limited preventive health services. Hence, research on gender variations in cardiovascular risk and psychological stress in Quetta had been significant to local health planning and preventive measures.

MATERIAL AND METHOD

This study used a cross-sectional analytical design. It was conducted in a group of adult men and women who live in Quetta, Balochistan during the period from February 2023 to August 2023. The sample population was composed of adults of 30 years and older. Willing participants who could participate in the study and could give the necessary information were included. People who were severely mentally ill, had acute medical conditions that were not completed or those who had not answered fully were excluded.

The model analysis was carried out on a sample of 300 subjects (150 males and 150 females). The participants were identified using non-probability convenient sampling method in the community and outpatient settings in Quetta. The structured questionnaire was used to gather data. The following information was included in the questionnaire: age, gender, marital status, education, occupation, smoking status, physical activity, family history of cardiovascular disease, diabetes, hypertension, and body mass index.

A perceived stress scale was used to measure psychological stress. The stress scores were grouped as low, moderate and high stress groups. The measurement of cardiovascular risk was done based on the prevalent clinical and behavioural predictors, such as hypertension, diabetes, overweight or obesity, smoking, physical inactivity, and the family history of cardiovascular disease. Participants that combined several risk factors were deemed to have more cardiovascular risk.

Blood pressure measurement was done by use of normal sphygmomanometer or digital blood pressure devices. The height and weight were measured to compute body mass index. Statistical software helped to input and analyse the data. Categorical variables were calculated in terms of frequencies and percentages. Mean and standard deviation were used for continuous variables. The chi-square test was used to compare the categorical variables between the males and females. The comparison of mean stress scores was conducted with the help of independent sample t -test. The logistic regression analysis was applied to determine the factors that are related to the increased cardiovascular risk. A p -value of less than 0.05 was regarded as statistically significant.

The study was conducted using ethical principles. Participation was voluntary. Each participant was informed of the study and gave informed consent. The privacy of the participants was ensured; no personal identity was revealed in the analysis.

RESULTS & ANALYSIS

This chapter presented the findings of the study conducted to assess gender differences in cardiovascular risk and psychological

stress among adults in Quetta, Pakistan. The analysis was based on 300 participants, including 150 males and 150 females. The results were presented through descriptive statistics, cross-tabulation, chi-square analysis, comparison of mean stress scores, and logistic regression analysis.

Demographic Profile of Participants: A total of 300 adult participants were included in the study. The sample consisted of equal numbers of males and females. Most participants belonged to the age group of 30–49 years. The mean age of the participants was 44.6 ± 9.8 years.

The sample showed equal gender representation. This helped in making a clear comparison between male and female participants regarding cardiovascular risk and psychological stress.

The majority of the participants were between 30 and 49 years of age. The age distribution was almost similar among males and females. This showed that both gender groups were comparable in terms of age.

The results showed that marital status was not significantly different between males and females. However, education and employment status showed significant gender differences. A higher proportion of males had intermediate or higher education and formal employment. Most female participants were involved in household work or were unemployed. This reflected the social and economic differences between male and female participants in the study setting.

Cardiovascular Risk Factors: Cardiovascular risk was assessed through selected clinical and behavioural factors, including hypertension, diabetes mellitus, overweight or obesity, smoking, physical inactivity, and family history of cardiovascular disease.

The analysis showed that overweight or obesity was significantly higher among female participants. Physical inactivity was also significantly more common among females. In contrast, smoking was significantly higher among males. Hypertension and diabetes were slightly more frequent among females, but the difference was not statistically significant. Family history of cardiovascular disease was also somewhat higher among females, although the difference was not significant.

These findings indicated that men and women had different cardiovascular risk patterns. Male participants were more exposed to smoking, while female participants were more affected by obesity and physical inactivity.

Level of Psychological Stress: Psychological stress was measured through a perceived stress scale and was categorized into low, moderate, and high stress levels.

The findings showed that moderate stress was common among both males and females. However, high stress was more frequent among females. Only 11.3% of females had low stress compared with 24.0% of males. The difference between gender and psychological stress level was statistically significant.

This showed that female participants experienced a greater burden of psychological stress than male participants. The mean stress score was higher among females than males. The difference was statistically significant. This finding supported the result that psychological stress was more severe among female participants.

Overall Cardiovascular Risk: Participants were classified as having increased cardiovascular risk when they had multiple cardiovascular risk indicators such as hypertension, diabetes, obesity, smoking, physical inactivity, or family history of cardiovascular disease.

The overall cardiovascular risk was higher among females than males. About 42.7% of females had increased cardiovascular risk compared with 36.7% of males. However, this difference was not statistically significant. This suggested that female participants had a slightly higher risk burden, but the difference may have been influenced by other factors such as age, obesity, hypertension, diabetes, and stress.

Association between Stress and Cardiovascular Risk: The relationship between psychological stress and cardiovascular risk

was analysed by comparing stress levels with increased cardiovascular risk.

The table showed a clear increase in cardiovascular risk with increasing stress level. Among participants with low stress, only 22.6% had increased cardiovascular risk. Among those with moderate stress, 39.7% had increased risk. The highest proportion of increased cardiovascular risk was observed among participants with high stress, where 52.1% had increased risk.

The association between stress level and cardiovascular risk was statistically significant. This showed that psychological stress was an important factor linked with cardiovascular risk among adults in Quetta.

Gender-wise Association between High Stress and Cardiovascular Risk: A separate analysis was performed to examine whether high stress was linked with increased cardiovascular risk differently among males and females.

The findings showed that high stress was associated with increased cardiovascular risk in both males and females. However, the proportion of increased cardiovascular risk among highly stressed females was higher than among highly stressed males. This suggested that psychological stress may have had a stronger relationship with cardiovascular risk among women.

Logistic Regression Analysis: Logistic regression analysis was performed to identify the predictors of increased cardiovascular risk. The dependent variable was increased cardiovascular risk. The independent variables included gender, age, high stress, hypertension, diabetes mellitus, overweight or obesity, smoking, and physical inactivity.

The regression model showed that high psychological stress was significantly associated with increased cardiovascular risk. Participants with high stress were about two times more likely to have increased cardiovascular risk than those with low or moderate stress.

Age 50 years and above was also a significant predictor. Older participants had a greater chance of having increased cardiovascular risk. Hypertension was the strongest predictor in the model. Participants with hypertension were more than three times more likely to have increased cardiovascular risk. Diabetes mellitus, overweight or obesity, and physical inactivity were also significant predictors.

Female gender showed increased odds of cardiovascular risk, but the association was not statistically significant after adjustment. This suggested that the higher cardiovascular risk observed among females was mainly explained by stress, obesity, physical inactivity, hypertension, and diabetes rather than gender alone.

Smoking showed increased odds of cardiovascular risk, but the association was not statistically significant in the adjusted model. This may have been due to the smaller number of female smokers and the influence of other stronger clinical risk factors in the model.

Summary of Major Findings: The results of the study showed that gender differences existed in both cardiovascular risk factors and psychological stress among adults in Quetta. Females had higher levels of psychological stress, overweight or obesity, and physical inactivity. Males had a much higher frequency of smoking. Hypertension and diabetes were slightly more common among females, although these differences were not statistically significant.

Psychological stress showed a significant association with cardiovascular risk. Participants with high stress had a higher proportion of increased cardiovascular risk compared with those having low or moderate stress. Logistic regression analysis further confirmed that high stress, older age, hypertension, diabetes, overweight or obesity, and physical inactivity were significant predictors of increased cardiovascular risk.

Overall, the results indicated that cardiovascular risk among adults in Quetta was influenced by both medical and psychosocial factors. The findings also showed that preventive programs should consider gender-specific risk patterns. For men, smoking

prevention and lifestyle improvement were important. For women, stress management, physical activity promotion, weight control, and routine screening for hypertension and diabetes were especially needed.

Table 4.1: Distribution of Participants According to Gender

Gender	Frequency	Percentage
Male	150	50.0
Female	150	50.0
Total	300	100.0

Table 4.2: Age Distribution of Participants

Age Group	Male n (%)	Female n (%)	Total n (%)
30–39 years	52 (34.7)	58 (38.7)	110 (36.7)
40–49 years	47 (31.3)	44 (29.3)	91 (30.3)
50–59 years	32 (21.3)	30 (20.0)	62 (20.7)
60 years and above	19 (12.7)	18 (12.0)	37 (12.3)
Total	150 (100.0)	150 (100.0)	300 (100.0)

Table 4.3: Socio-demographic Characteristics of Participants

Variable	Male n (%)	Female n (%)	Total n (%)	p-value
Married	118 (78.7)	124 (82.7)	242 (80.7)	0.38
Unmarried/Widowed/ Divorced	32 (21.3)	26 (17.3)	58 (19.3)	
No formal/primary education	27 (18.0)	55 (36.7)	82 (27.3)	<0.001
Secondary education	45 (30.0)	46 (30.7)	91 (30.3)	
Intermediate or above	78 (52.0)	49 (32.6)	127 (42.4)	
Employed	118 (78.7)	42 (28.0)	160 (53.3)	<0.001
Unemployed/ Household work	32 (21.3)	108 (72.0)	140 (46.7)	

Table 4.4: Distribution of Cardiovascular Risk Factors by Gender

Cardiovascular Risk Factor	Male n (%)	Female n (%)	Total n (%)	p-value
Hypertension	52 (34.7)	60 (40.0)	112 (37.3)	0.34
Diabetes mellitus	30 (20.0)	38 (25.3)	68 (22.7)	0.27
Overweight/obesity	74 (49.3)	91 (60.7)	165 (55.0)	0.048
Current smoking	67 (44.7)	8 (5.3)	75 (25.0)	<0.001
Physical inactivity	58 (38.7)	83 (55.3)	141 (47.0)	0.004
Family history of cardiovascular disease	42 (28.0)	51 (34.0)	93 (31.0)	0.26

Table 4.5: Psychological Stress Level by Gender

Stress Level	Male n (%)	Female n (%)	Total n (%)	p-value
Low stress	36 (24.0)	17 (11.3)	53 (17.7)	0.002
Moderate stress	86 (57.3)	88 (58.7)	174 (58.0)	
High stress	28 (18.7)	45 (30.0)	73 (24.3)	
Total	150 (100.0)	150 (100.0)	300 (100.0)	

Table 4.6: Comparison of Mean Stress Score by Gender

Gender	Mean Stress Score	Standard Deviation	p-value
Male	18.1	6.2	<0.001
Female	22.4	6.8	
Total	20.2	6.8	

Table 4.7: Overall Cardiovascular Risk by Gender

Gender	Normal/Lower Risk n (%)	Increased Risk n (%)	Total n (%)	p-value
Male	95 (63.3)	55 (36.7)	150 (100.0)	0.29
Female	86 (57.3)	64 (42.7)	150 (100.0)	
Total	181 (60.3)	119 (39.7)	300 (100.0)	

Table 4.8: Association Between Psychological Stress and Cardiovascular Risk

Stress Level	Normal/Lower Risk n (%)	Increased Risk n (%)	Total	p-value
Low stress	41 (77.4)	12 (22.6)	53	0.003
Moderate stress	105 (60.3)	69 (39.7)	174	
High stress	35 (47.9)	38 (52.1)	73	
Total	181 (60.3)	119 (39.7)	300	

Table 4.9: High Stress and Cardiovascular Risk by Gender

Gender	High Stress Present	Increased Cardiovascular Risk n (%)	p-value
Male	28	13 (46.4)	0.041
Female	45	25 (55.6)	0.018

Table 4.10: Logistic Regression Analysis for Increased Cardiovascular Risk

Predictor	Adjusted Odds Ratio	95% Confidence Interval	p-value
High psychological stress	2.08	1.21–3.57	0.008
Female gender	1.31	0.82–2.09	0.26
Age 50 years and above	2.74	1.66–4.51	<0.001
Hypertension	3.10	1.87–5.14	<0.001
Diabetes mellitus	2.29	1.27–4.13	0.006
Overweight/obesity	1.87	1.15–3.04	0.012
Smoking	1.54	0.89–2.66	0.12
Physical inactivity	1.69	1.04–2.75	0.034

Discussion, Summary, Conclusion and Recommendations:

This chapter gave the discussion of the study findings in as far as the gender differences in cardiovascular risk and psychological stress among adults in Quetta, Pakistan. It also contained the summary of key findings, conclusion, recommendations, and limitations of the study.

DISCUSSION

In the current research, gender variations in cardiovascular risks and psychological stress of adult males and females in Quetta were evaluated. The results indicated that both gender groups had cardiovascular risk factors, but their prevalence varied between the two sexes. Psychological stress, overweight or obesity and physical inactivity were higher among females whereas smoking was prevalent among males. The results indicated that cardiovascular risk in Quetta did not only exist in the presence of clinical factors but also in association with the presence of social, behavioural, and psychological factors.

The age group of the respondents revealed that the majority of the respondents were middle aged adults. This was significant since the risk of cardiovascular typically rose with age. In this research, the participants were aged 50 years and above and were more likely to have increased cardiovascular risk. This result was anticipated given that ageing had been associated with high blood pressure, low physical activity, gaining of weight, developing diabetes and other metabolic diseases. As they grew older, the cumulative impact of unhealthy living and unmitigated risk factors became more apparent.

It was discovered that there were more cases of overweight and obesity in females than in males. This result could have been associated with decreased physical activity, domestic based lifestyle, cultural limitations, unavailability of recreational amenities and limited access to regular physical activity among women. Women had continued to be physically active in the household, and yet, this activity was not always adequate to keep the women out of the reach of obesity and metabolic risk. Further, the dietary habits, multiple pregnancies, hormonal shifts, and inadequate health education may also have played a role in weight gain among women.

Females were also more likely to be physically inactive. This result was an indicator of a significant gender-based health concern in the community. Social restrictions, inaccessibility of safe spaces, household roles, and lack of family support of outdoor physical activity may have been barriers to women in Quetta. Physical inactivity had been a significant factor of obesity, hypertension, diabetes and poor cardiovascular health. Thus, the increased level of physical inactivity in females contributed to some of their greater cardiovascular risk.

The prevalence of smoking was found to be significantly higher in males. This indicated the general societal trend in Pakistan, where men were more inclined towards smoking compared to women. The male subjects can have employed smoking as a stress coping behaviour or work or social habit pressure. Smoking also enhanced cardiovascular risk by rupturing blood vessels, elevating blood pressure, decreasing oxygen availability, and increasing the risk of heart disease. Though in this study the smoking was not prevalent among females, this group was not exempt in cardiovascular risk because other factors especially stress, obesity, and physical inactivity were more prevalent among them.

A significant percentage of the participants were found to have hypertension. It occurred a little more frequently in females compared to males; however, the difference was not statistically significant. One of the most predictive factors that contributed to higher cardiovascular risk in the regression analysis was hypertension. This demonstrated that blood pressure management had been a key social health requirement of Quetta. A number of hypertensive individuals might have not known their condition and others might have not taken medicines regularly. The diet, salt consumption, stress, obesity, diabetes, and physical activity might

have played a role in hypertension among the research participants.

Both males and females also had diabetes. It was a bit more among females, but this was not statistically significant. The regression model showed that diabetes has a significant relationship with more cardiovascular risk. This result indicated that diabetes had significantly contributed to cardiovascular susceptibility. The study population may have been exposed to poor dietary habits, obesity, lower levels of physical activity, as well as lack of routine screening, which may have contributed to the higher burden of diabetes in the population.

One of the key discoveries of this research was that females' participants had a greater psychological stress compared to males. Females were more often reported to have a higher stress level, and their average stress level was also higher. This observation was significant since psychological stress had always been under-appreciated in cardiovascular health screening. Locally, women might have been stressed due to their household duties, financial reliance, family pressure, lack of decision-making power, family care, and inaccessibility of social support. Lack of time, emotional load could also have contributed to stress levels among the women.

It also demonstrated that psychological stress was strongly related to cardiovascular risk. Highly stressed participants were more likely to have higher proportions of increased cardiovascular risk than those who had low or moderate stress. This result implied that stress could have influenced cardiovascular health via various mechanisms. The stress could have raised blood pressure, poor sleep, altered eating habits, less physical exercise, and lack of motivation toward health care. Stressful people might as well have disregarded the onset of the conditions, missed showings, or neglected treatment guidance.

The gender-based analysis revealed that high levels of stress were associated with an increased cardiovascular risk in both males and females, but the percentage was higher among females. This implied that stress could be more likely to impact cardiovascular risk in women. It is also possible that women with high stress levels have been exposed to other risk factors such as obesity, lack of activity and untreated hypertension. All these factors might have made them more susceptible.

The logistic regression analysis established that the high psychological stress, age 50 years and above, hypertension, diabetes, overweight or obesity, and physical inactivity were significant predictors of high cardiovascular risk. Female gender increased odds of cardiovascular risk but was statistically nonsignificant after adjustment. This showed that gender alone was not the only reason for cardiovascular risk. Rather, the risk was determined by the interplay of stress, obesity, inactivity, hypertension, diabetes, and age.

The implications of these findings were significant to the health care planning in Quetta. The prevention programs of cardiovascular diseases must not be limited to medicine and clinical treatment. They must also have stress screening, lifestyle education, weight management, promotion of physical activity, prevention of smoking, and routine blood pressure and diabetes screening. Women should be given special attention since the cardiovascular risk that they may have remains concealed due to the social and cultural factors. Community-based awareness campaigns would assist men and women to have an awareness of the importance of stress and lifestyle in the health of the heart.

Summary: The study was done to evaluate the gender differences in cardiovascular risk and psychological stress in adults in Quetta, Pakistan. The sample population consisted of 300 individuals, half of them males and the other half, females. The study assessed socio-demographic factors, cardiovascular risk factors, level of psychological stress, and the overall cardiovascular risks.

The results indicated that males and females differed in patterns of cardiovascular risk. The smoking was much more prevalent among males, whereas overweight or obesity and physical inactivity were much more prevalent among females. Both

groups had a high prevalence of hypertension and diabetes. Psychological stress levels were more in female participants than male participants. Females were found to have higher stress levels and the mean stress amongst them was also found to be much higher.

Another important finding of the study is that there is a strong correlation between psychological stress and cardiovascular risk. The percentage of augmented cardiovascular danger was greater among the participants who were highly stressed. Regression analysis indicated that high stress levels, age, hypertension, diabetes, overweight or obesity, and lack of physical activity were significant predictors of increased cardiovascular risk.

Overall, the analysis revealed that the medical and psychosocial factors were important in determining the cardiovascular risk in adults in Quetta. Gender differences existed, yet the risk could be primarily attributed to the behavioural, clinical, and psychological factors.

CONCLUSION

The research concluded that there were gender variations in cardiovascular risk and psychological stress in adult people in Quetta. The psychological stress was more among female participants, overweight or obese, and physically inactive. The strain of smoking was higher among male participants. Psychological stress was substantially related to elevated cardiovascular risk, and this association seemed to be stronger in females.

Significant predictors of cardiovascular risk were hypertension, diabetes, older age, overweight or obesity, physical inactivity. The results indicated that prevention of cardiovascular diseases in Quetta should entail physical and psychological health evaluation. At the community and primary health care levels, routine screening of blood pressure, diabetes, obesity, smoking, physical inactivity, and stress should be encouraged.

The paper also gave the conclusion that there was a need to have gender-sensitive health programs. In the case of males, it mattered to control smoking and lifestyle change. Among the women, it was particularly necessary to work on stress management, promotion of physical activity, weight control, and early screening. Targeting these determinants may be useful in alleviating the burden of cardiovascular disease in the future in Quetta.

Recommendations: According to the results of the study, the following recommendations were drawn up:

- Routine cardiovascular screening needs to be encouraged among adults in Quetta, particularly the blood pressure, diabetes, obesity, and family history of cardiovascular disease.
- Primary health care visits should have psychological stress assessment since the cardiovascular risk was significantly related to stress.
- The special consideration that women should receive in community health programs is that they were found to be more psychologically stressed, obese and physically inactive.
- The health education should be organized to enhance the awareness of cardiovascular risk factors, healthy diet, exercise, stress management, and early medical consultation.
- Men should have their smoking prevention and cessation programs reinforced due to the fact that smoking was a high occurrence among the men participating in the study.
- Physical activity programs, conducted at the community level must be promoted, particularly among women, taking into consideration the local cultural and social conditions.
- It is necessary to promote family level counselling and women should be supported with stress reduction, physical exercise and timely health care.

- Primary health care centres in Quetta should have a regular screening record of hypertension, diabetes, obesity and stress related complaints.
- To enhance a high level of generalizability, a greater sample size and probability sampling should be researched further.
- The studies in the future ought to incorporate lipid profile, dietary assessment, sleep pattern, detailed socioeconomic status in order to provide a comprehensive understanding of cardiovascular risk.

Study Limitations: There were a few limitations to this study. The cross-sectional design could not provide an opportunity to establish a cause-and-effect relationship between psychological stress and cardiovascular risk. Convenient sampling was used to select the sample and therefore the results might not be a full representation of all adults living in Quetta. Part of the data were self-reported; thus, they may have been subject to recall bias or under-reporting, particularly in the case of smoking among females and stress related responses. The researchers also employed the use of selected cardiovascular risk indicators, and complete laboratory investigations such as lipid profile might not have been available to all the participants.

Nevertheless, despite these limitations, the study presented valuable information regarding the difference between genders in relation to cardiovascular risk and psychological stress among adults in Quetta. The results may be required in the planning of the local health education, screening, and prevention programs.

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