SOCIAL SUPPORT AND IMPACT OF STRESS MANAGEMENT ON SOCIAL SUPPORT IN CARDIOVASCULAR DISEASE PATIENTS

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Abstract
Background: Social support is an important aspect of the management of cardiovascular diseases. Low social health may lead to adverse outcomes in cardiovascular disease patients. A comparative study assessed social support in CVD patients, and a pretest posttest design with control examined the impact of stress management on the level of social support. \
Methods: The Multidimensional Scale of Perceived Social Support was used to measure social support in CVD patients. During phase I, the sample size was 200 (100 CVD patients and 100 participants with no CVD). A random sampling technique was used. During phase II, the psychological intervention of stress management was administered to 60 CVD patients (30 in the intervention group and 30 in the control group). The participants were evaluated in 3 categories on social support scale: significant other (SO), family, and friends on a 7-point Likert scale. Demographic data of the participants was recorded.
Results: Cardiovascular disease patients reported a low level of social support as compared to the control group. Stress management intervention revealed significantly higher scores in the friend, family, and significant other subscales, respectively.
Conclusion: Cardiovascular disease patients revealed low social support and stress management intervention improved the level of social support in CVD patients.

Keywords: Cardiovascular disease, Heart, Social support, Stress management

Introduction
Cardiovascular disease is a group of disorders that include coronary artery disease (CAD), cerebrovascular disease, rheumatic heart disease, peripheral artery disease, and congenital heart disease. Sometimes, cardiovascular patients do not manifest any indications, and the first sign may be a stroke or heart attack. (WHO, 2021).
Health and economic burdens in the United States and globally are increasing due to CVD (Tsao et al., 2022). Cardiovascular disease (ischemic heart disease, stroke) remained the top global cause of mortality, which causes about 16% of total deaths in the world (WHO, 2020). The major cause of mortality was coronary heart disease (41.3%), stroke (17.2%), and other CVD (17.3%), respectively, in 2019 in the United States (AHA, 2022).
Social support plays a vital role in managing CVD disorders (Hashim et al., 2022). Social support is strongly and consistently associated with cardiovascular disease (CVD) risk, development, and

outcomes, according to an increasing body of research. There is a correlation between cardiovascular events, mortality and low social support in individuals lacking social support, access to assistance, a confidant, or other sources of emotional support. (Czajkowski et al., 2022). Stress and perceived social support are independent risks for women. Cardiac rehabilitation programs focus on patients with high levels of stress and limited social support. Social support and stressful life events independently affect CAD patients' health, especially female patients. High-stress, low-social support patients should be considered while establishing cardiac rehabilitation programs (Staniute et al., 2013). Social support is a predictor of health status after acute myocardial infarction (AMI) Low social support is associated with adverse health status and depression 12 months after AMI in both young men and women. Furthermore, gender did not affect social support (Bucholz et al., 2014).

The structure of support for patients with debilitating medical diseases like CVD requires special consideration for all ages. The investigation of the relation of social support to cardiovascular disease is most the important research dimension. The lower level of social support was observed in male patients, living alone, with financial problems, and high disease severity. Age was not associated with social support (Årestedt et al., 2012). Substance use avoidance (tobacco) was also associated with high social support from friends, family, and significant other. Patients with high a quality of life reported a higher score of PSS on the Likert subscale of support from family (Wenn et al.,2022). Emotional support from close relatives and support from extended networks was low in middle-aged men in coronary heart disease patients and both factors were significant predictors of new congestive heart failure (CHD) events. The study found that lack of social support was the leading risk factors for middle-aged CHD in these men (Orth-Gomér et al., 1993). Data from a 15-year follow-up of middle-aged men indicated that they can benefit from social support in terms of protection against new coronary events (Rosengren, 2004). Poor social health was 42 % more likely to develop CVD and the risk of mortality from CVD was two-fold ($p = 0.02$). Low social support and isolation but not loneliness, predicted incident CVD (Freak-Poli et al., 2021). Potential avenues among older adults were the management of poor social health and CVD risk. Men were more socially isolated, less socially supported and less lonely than women (Hu et al., 2021). The social determinants of health must now be included in the analysis of CVD. The risk of CVD was considered to result from a combination of genetic, behavioral, and physiological risk factors, both modifiable and non-modifiable. If this third risk factor is not considered, the burden of CVD will increase, particularly for those who have the least resources to interact with the healthcare system. (Havranek et al., 2015). The cohort study enrolled 49,259 women between the ages of 30 and 50. Years of schooling and socioeconomic level were significantly inversely associated with CHD risk whereas social support was weakly related to CHD (Kuper et al., 2006). Coronary heart disease patients, lacking social support or having unstable angina, and stroke may suffer from depression. These results are helpful in the understanding of cardiovascular patients' physical and mental health issues. The study proposed that early diagnosis of depression and adequate social support can help patients facing CVD, which will enhance the standard of care and lead to treatment of depression (Su et al., 2018).

Methodology
Design of the Study
Assessment and comparison of social support in CVD patients and the control group was done by a comparative study design. The impact of psychological interventions of stress management on the level of social support was studied by pretest-posttest design with control.

Population of Study
The participants diagnosed with CVD by the attending cardiologist were recruited for the study. The study participants comprised male and female patients with cardiovascular disease. For this study, participants were selected from the outpatient department of two hospitals.

Sample and sampling technique

In phase I of the study, 200 male and female participants (N =200) were randomly selected for comparative studies to assess and compare the level of social support. The patients with CVD (n =100) were selected randomly from those diagnosed by a cardiologist and non-CVD participants (n =100) were also selected randomly from the general population and were also randomly assigned to control and experimental groups.

To see the influence of stress management on social support, in phase II of the study, 60 CVD patients were recruited with significant scores on MPSS from Phase-I, who consented to participate in the study of stress management intervention. Thirty CVD patients were randomly assigned to the intervention and thirty to the control group given no stress management intervention. The sample size was estimated by software G*Power version 3.1.9.7 at 5% level of significance, a power of 80% to detect a difference of 0.30 and 20 for comparative and interventional studies, respectively (Faul et al., 2009; Kang, 2021).

Inclusion criteria
- Males and females with a definite diagnosis of cardiovascular disease (CVD).
- Cardiovascular disease patients from the outpatient department (OPD),
- Patients within two months after the diagnosis of CVD.
- Males and females from 40-65 years of age.

Exclusion Criteria
- Males and females below 40 or above 65 years of age.
- Patients with severe mental disorders.
- Patients with unstable heart conditions.
- Participants on psychotropic drugs.
- Participants with severe lung disease.
- Participants with comorbid serious conditions (e.g., Cancer or AIDS).
- Participants with dementia and Alzheimer's disease or severe cognitive impairments.

Multidimensional Scale of Perceived Social Support Scale (MSPSS; Zimet et al., 1988)

The scale has 12 questions and examines the support of individuals from family, friends and significant others. The scale is reliable, valid and extensively used (Zimet et al., 1988). The internal consistency value of social support from family, friends, and other important was 0.95, 0.96, and 0.92, respectively. Good convergent validity and adequate divergent validity were also reported (Sharif et al., 2021). The scale was reported as psychometrically reliable and valid for measuring social support (Clara et al., 2003). The MSPSS is a valid and reliable instrument to measure perceived social support in patients with heart failure. The MSPSS demonstrated high internal consistency reliability (Shumaker et al., 2017).

Psychological interventions

Psychological intervention of stress management was evaluated in CVD patients. The sessions were conducted by psychologists (volunteer basis) with master's degrees and diplomas in clinical psychology or MS clinical psychology degree holders.

Stress management intervention

Pre-intervention data for intervention and control was recorded by MPSS. The intervention for stress management comprised of free of cost, eight weekly sessions of 90 minutes for cardiovascular patients delivered in a group format. The sessions focused on the introduction of stress, explanation association between thoughts and feelings, relaxation training, identification of cognitive distortions, counteracting anxiety and depression, improving social relations and social support and focus on responses for effective coping with stress. After each session, a summary of the meetings was

provided to the participants. The control group did not receive any intervention (Orth-Gomér et al., 2009; Ghazavi et al., 2016). The outcome of the research was to evaluate the level of anxiety, depression, stress, and social support at pre-intervention and post-intervention.

Procedure
The investigation was carried out in the following two phases, and the recruitment of the participants spanned over two months.

Phase-I
During Phase I of the study, a sample of 100 CVD patients was selected randomly from two different hospitals, within two months of diagnosis of CVD. For the control group or comparison, 100 participants who do not have CVD as per the attending cardiologist, were selected randomly from OPDs of two hospitals. Demographic data about, age, gender, education level, socioeconomic status, and smoking status was recorded. For socioeconomic status, the present study classified the participants as per the historical classification of the World Bank according to per capita in US dollars and converted to rupees as per exchange at the time of baseline data collection. The participants were classified into low ($ US 1135=Rs:283750), Middle ($ US 1136-4465=Rs.284000 -1116250), and High ($ US 4466-13845=Rs.1116500-3461250) socioeconomic status. (World Bank Country and Lending Groups–World Bank Data Help Desk, n.d.). The questionnaire, MSPSS was administered to CVD participants and the control group for comparative study.

Phase II
To see the influence of the psychological intervention of stress management on the level of social support, 60 participants out of 100 randomly recruited CVD patients during Phase I, with high scores on MSPSS and those consented to enroll in the interventional study, Further, recruitment may be continued to achieve the estimated sample size. Out of sixty participants, thirty were randomly assigned to the experimental group and thirty to the control group (no stress management). The intervention of stress management was administered to all the recruited smoker CVD patients within one month after recording data before the intervention. Post-intervention was recorded on the timeline of one month and three months after the intervention.

Data analysis
The data was analyzed by applying various statistical tests using SPSS version 25. The demographic characteristics of the subjects were explained by using descriptive statistics. Data for comparative studies was analyzed by independent sample t-test repeated measures ANOVA for pretest and posttest design with control to compare the means at 0.05 levels of significance.

Ethical considerations
The participants were explained and ensured that ethical considerations like informed consent, privacy, and confidentiality were observed. Confidentiality was ensured by assigning a code to each participant, and his/ or her participation was voluntary. The right to withdraw was explained to them before participation. The participants were briefed about the nature and aim of the study and their questions were answered properly. Verbal consent was obtained from the participants. The data was kept confidential and anonymous, and access was only given to the research team.

Results

Table 1 Sociodemographic Characteristics of Participants at Baseline

	Comparative Study		Stress Management Study	
Characteristics	*n*	%	*n*	%
Gender	100	50	23	38.3
Male	100	50	37	61.7
Female	100	50	23	38.3
Age				
Middle Age (40-50 years)	89	44.5	18	30
Old Age (51-65 years)	111	55.5	42	70
Education				
Matric	70	35	38	63.3
Graduate	61	30.5	12	20
Postgraduate	69	34.5	10	16.7
Socioeconomic Status				
Low socioeconomic status	67	33.5	39	65
Medium socioeconomic status	71	35.5	16	26.7
High socioeconomic status	62	31	5	8.3

The sociodemographic characteristics

The sociodemographic information of the sample is presented in Table 1. Sociodemographic data was collected from the participants by the administration of the demographic sheet. For the comparative study, (Phase I) out of 200 study participants, 100 (50%) were male, and 100(50%) were female. Regarding the age of the participants, 89 (44.5%) were between the age of 40-50 years and 111(55.5%) were between the age of 51-65 years. The educational background of the participants was different, 70 (35%) were matric, 61(30.5%) were graduate and 69(34%) were postgraduates. The socioeconomic status of the participants was different, 67(33.5%) had low socioeconomic status, 71(35.5%) had medium socioeconomic status and 62 (31%) reported high socioeconomic status.

For the interventional study of stress management (Phase-II) of stress management out of 60 participants, 37(61.7%) were male and 23(38.3%) were female, respectively. The age of the participants also differed and out of 60, 18(30%), and were between 40-50-year-old, and 42 (70%) were 51-65 years old. Out of 60 participants, 38(63.3%),12 (20%) 10(16.7 %) were matric, graduate and postgraduate, respectively. Regarding the socioeconomic status of the participants for the study, 39(65%) had low socioeconomic status, 16(26.7%) and 5(8.3%) had medium and high socioeconomic status, respectively.

Table 2 *Social Support Level in Cardiovascular Disease Patients and Normal Participants*

Subscale	Control Group		CVD patients		$t(198)$	*p*	Cohen's *d*
	M	*SD*	*M*	*SD*			
Friends	3.94	1.11	3.60	1.07	2.22	0.01	0.31
Family	3.80	1.31	3.29	1.20	2.84	0.00	0.41
Significant Other	4.01	1.00	3.78	0.97	1.16	0.05	0.23

Social support was assessed and compared between CVD patients and the control group (non-CVD participants). It was hypothesized that CVD patients would report low scores of social support as compared to the control. We used independent sample t-test to find the differences between the means of social support of the CVD and the control groups. On the subscale of family, significant mean differences in social support from family of CVD and non CVD participants was noted, *t* (198) =2.84, *p* = 0.001 and Cohen's *d* (0.30) with a small effect size. The data analysis of the subscale of social support from friends also indicated significant mean differences of CVD and non-

CVD participants on the subscale of friends, t (198) =2.22, p = 0.05. However, Cohen's d (0.32) showed a small effect size. The social support of CVD patients on the subscale of significant others revealed significant differences as compared to non-CVD participants, t (198) =1.16, p = 0.05, and Cohen's d (0.23) with a small effect size.

Table 3 *Descriptive Statistics of the Impact Stress Management on Social Support in Cardiovascular Disease Patients*

Subscale	Group	Pretest		Posttest 1		Posttest 2		
		M	*SD*	*M*	*SD*	*M*	*SD*	N
Friends	Intervention	4.90	1.13	3.60	1.46	1.89	0.92	30
	Control	4.38	0.96	3.63	1.13	2.16	1.03	30
Family	Intervention	4.73	0.79	3.45	1.28	1.68	1.15	30
	Control	5.02	0.95	4.63	0.81	2.98	1.15	30
Significant others	Intervention	4.06	0.83	3.59	1.26	3.40	0.97	30
	Control	3.85	0.91	2.68	1.10	3.38	1.03	30

Table 4 *Box's Test of Equality of Covariance Matrices*

Test Value	Subscale		
	Friends	Family	Significant others
Box's M	12.56	12.77	13.08
F	1.98	2.01	2.05
df1	6	6	6
df2	24373.13	24373.13	24373.13
Significance	0.07	0.06	0.06

Table 4 demonstrated that the covariance matrices were the same between the experimental and control groups.

Table 5 *Within Subject Results*

Source	Subscale	Test	*F*	*p*	Partial eta squared
Factor	Friends	Sphericity Assumed	96.46	.000	0.62
		Greenhouse-Geisser effects	96.46	.000	0.62
		Hyphen-Feldt	96.46	.000	0.62
		Low-bound	96.46	.000	0.62
	Family	Sphericity Assumed	142.18	.000	0.80
		Greenhouse-Geisser effects	142.18	.000	0.80
		Hyphen-Feldt	142.18	.000	0.80
		Low-bound	142.18	.000	0.80
	Significant Others	Sphericity Assumed	23.45	.000	0.44
		Greenhouse-Geisser effects	23.45	.000	0.44
		Hyphen-Feldt	23.45	.000	0.44
		Low-bound	23.45	.000	0.44
		Sphericity Assumed	23.45	.000	0.44

The results in Table 5 showed that the pretest, posttest1, and posttest2 level of social support on three subscales was statistically significant.

Table 6 *Multiple Comparisons by Bonferroni*

Dependent Variable	(I) Factor 1	(J)Factor 1	Mean Difference (I-J)	Standard Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Friends	Pretest	Posttest 1	1.025*	.174	.000	.596	1.454
		Posttest 2	2.613*	.198	.000	2.126	3.099
	Posttest 1	Pretest	-1.025*	.174	.000	-1.454	-.596
		Posttest 2	1.588*	.196	.000	1.104	2.071
	Posttest 2	Pretest	-2.613*	.198	.000	-3.099	-2.126
		Postest1	-1.588*	.196	.000	-2.071	-1.104
Family	Pretest	Posttest 1	.833*	.133	.000	.505	1.161
		Posttest 2	2.538*	.169	.000	2.122	2.953
	Posttest 1	Pretest	-.833*	.133	.000	-1.161	-.505
		Posttest 2	1.704*	.156	.000	1.318	2.090
	Posttest 2	Pretest	-2.538*	.169	.000	-2.953	-2.122
		Postest1	-1.704*	.156	.000	-2.090	-1.318
Significant Others	Pretest	Posttest 1	.789*	.114	.000	.507	1.071
		Posttest 2	.571*	.111	.000	.297	.844
	Posttest 1	Pretest	-.789*	.114	.000	-1.071	-.507
		Posttest 2	-.219	.111	.159	-.492	.055
	Posttest 2	Pretest	-.571*	.111	.000	-.844	-.297
		Postest1	.219	.111	.159	-.055	.492

* Mean difference is significant at 5 % level of significance.
Post hoc comparison revealed significant differences between pretest, posttest1 and posttest2 and posttest scores of social supports on all the subscales of friends, family, and significant other.

Discussion

Cardiovascular disease is the major cause of morbidity and mortality all over the world. The benefits of social and familial support for patients with cardiovascular disease are widely documented in the literature but, the evidence is lacking about the improvement of social support by stress management intervention. Stress a major risk factor for both acute cardiovascular disease (CVD) events and the acceleration of atherosclerosis. There aren't many large, scalable, and affordable stress management strategies (Chinnaiyan, 2019). The objective of the study was to determine the level of perceived social support (PSS) in CVD patients and examine the impact of stress management intervention on the level of social support. Psychosocial variables are associated with a higher risk of cardiovascular morbidity and mortality; however, it is unclear how behavioral therapies would affect the psychosocial and medical facets of treating patients with cardiovascular disease. Comparable results showed that those with stable ischemic heart disease and who received stress management intervention experienced less psychological distress and improved cardiovascular risk markers more than those who received standard medical care only (Blumenthal et al., 2005). The results showed that CVD patients reported low scores of social support. Findings from a study reported similar results that coronary heart disease considerably impairs social participation due to physical or mental disabilities (Gronewold et al., 2021). There was no statistically significant relationship between CVD and social support. (Freeborne et al., 2019). However, these findings contradict the results of the current study. Another study demonstrated that insufficient empirical evidence exists to establish a significant correlation between social support and cardiovascular health (CVH). Additional research studies are required to evaluate the association between social support and cardiovascular health in various populations with different psychological risks (Jee Won Park et al., 2022)

Conclusion

The comparative study on the assessment of social support in cardiovascular disease patients highlighted that CVD patients had a lower level of social support than non-CVD participants. The psychological intervention of stress management led to the conclusion that stress management can improve the level of social support.

Limitations

The study population was confined to the cardiology outpatient departments. Patient response subjectivity was another limitation of the study. Furthermore, Likert scale may not be the appropriate method for quantifying the effect; however, they are typically used for patients to complete questionnaires that involve some level of effect quantification. There may also be variations in responses based on linguistic and cultural differences. This might have influenced the responses subjectively, the majority of whom spoke Punjabi or Urdu as their first language.

Implications

Cardiovascular disease is a debilitating disease that needs a structure of support for people of all ages. Social support can help patients to adhere to treatment regimens. The present study highlights the aspect that good social support can tremendously help in the treatment of cardiovascular conditions. Both the patient and the provider may benefit from taking the time to consult about a patient's support system. The strategy is to encourage a patient's family and friends to be educated about the treatment and lifestyle regimens and to attend appointments with CVD patients.

References

1. American Heart Association. (2022). *Heart Disease and Stroke Statistics Update Fact Sheet At-a-Glance*. https://www.heart.org/-/media/PHD-Files-2/Science-News/2/2022-Heart-and-Stroke-Stat-Update/2022-Stat-Update-At-a-Glance.pdf
2. Årestedt, K., Saveman, B.-I., Johansson, P., & Blomqvist, K. (2012). Social Support and its association with health-related quality of life among older patients with chronic heart failure. *European Journal of Cardiovascular Nursing*, *12*(1), 69–77. https://doi.org/10.1177/1474515111432997
3. Bucholz, E. M., Strait, K. M., Dreyer, R. P., Geda, M., Spatz, E. S., Bueno, H., Lichtman, J. H., D'Onofrio, G., Spertus, J. A., & Krumholz, H. M. (2014). Effect of Low Perceived Social Support on Health Outcomes in Young Patients with Acute Myocardial Infarction: Results from the VIRGO (Variation in Recovery: Role of Gender on Outcomes of Young AMI Patients) Study. Journal of the American Heart Association: *Cardiovascular and Cerebrovascular Disease*, 3(5). https://doi.org/10.1161/JAHA.114.001252
4. Blumenthal, J. A., Sherwood, A., Babyak, M. A., Watkins, L. L., Waugh, R., Georgiades, A., Bacon, S. L., Hayano, J., Coleman, R. E., & Hinderliter, A. (2005). Effects of Exercise and Stress Management Training on Markers of Cardiovascular Risk in Patients with Ischemic Heart Disease. *JAMA*, 293(13), 1626. https://doi.org/10.1001/jama.293.13.1626
5. Chinnaiyan, K. M. (2019). Role of stress management for cardiovascular disease prevention. *Current Opinion in Cardiology*, 34(5), 531–535. https://doi.org/10.1097/hco.0000000000000649
6. Clara, I. P., Cox, B. J., Enns, M. W., Murray, L. T., & Torgrudc, L. J. (2003). Confirmatory factor analysis of the multidimensional scale of perceived social support in clinically distressed and student samples. *Journal of personality assessment*, *81*(3), 265-270. https://doi.org/10.1207/s15327752jpa8103_09
7. Czajkowski, S. M., Arteaga, S. S., & Burg, M. M. (2022). Social Support and Cardiovascular Disease. *Handbook of Cardiovascular Behavioral Medicine*, 605–630. https://doi.org/10.1007/978-0-387-85960-6_25

8. Faul, F., Erdfelder, E., Buchner, A., & Lang, A. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, 41(4), 1149-1160. https://doi.org/10.3758/brm.41.4.1149

9. Freak-Poli, R., Ryan, J., Neumann, J. T., Tonkin, A., Reid, C. M., Woods, R. L., Nelson, M., Stocks, N., Berk, M., McNeil, J. J., Britt, C., & Owen, A. J. (2021). Social isolation, social support and loneliness as predictors of cardiovascular disease incidence and mortality. *BMC Geriatrics*, 21(1). https://doi.org/10.1186/s12877-021-02602-2

10. Freeborne, N., Simmens, S. J., Manson, J. E., Howard, B. V., Cené, C. W., Allison, M. A., Corbie-Smith, G., Bell, C. L., Denburg, N. L., & Martin, L. W. (2019). Perceived social support and the risk of cardiovascular disease and all-cause mortality in the Women's Health Initiative Observational Study. *Menopause*, 26(7), 698–707. https://doi.org/10.1097/GME.0000000000001297

11. Gronewold, J., Engels, M., van de Velde, S., Cudjoe, T. K. M., Duman, E.-E., Jokisch, M., Kleinschnitz, C., Lauterbach, K., Erbel, R., Jöckel, K.-H., & Hermann, D. M. (2021). Effects of Life Events and Social Isolation on Stroke and Coronary Heart *Disease. Stroke*, 52(2), 735–747. https://doi.org/10.1161/strokeaha.120.032070

12. Hashim, M., Azim, W., Hussain, W., Rehman, F. U., Salam, A., & Rafique, M. (2022). Quality of Life, Perceived Social Support and Death Anxiety Among People Having Cardiovascular Disorders: A Cross-Sectional Study. *Pakistan Journal of Medical and Health Sciences*, 16(4), 460–463. https://doi.org/10.53350/pjmhs22164460

13. Havranek, E. P., Mujahid, M. S., Barr, D., Blair, I. V., Cohen, M. S., Cruz-Flores, S., Davey-Smith, G., Dennison-Himmelfarb, C., Lauer, M. S., Lockwood, D. W., Rosal, M. C., & Yancy, C. W. (2015). Social Determinants of Risk and Outcomes for Cardiovascular Disease. *Circulation*, 132(9), 873–898. https://doi.org/10.1161/cir.0000000000000228

14. Hu, J., Fitzgerald, S. M., Owen, A. J., Ryan, J., Joyce, J., Chowdhury, E., Reid, C. M., Britt, C., Woods, R. L., McNeil, J. J., & Freak-Poli, R. (2021). Social isolation, social support, loneliness and cardiovascular disease risk factors: A cross-sectional study among older adults. *International Journal of Geriatric Psychiatry*. https://doi.org/10.1002/gps.5601

15. Jee Won Park, Howe, C. J., Dionne, L., Scarpaci, M. M., Needham, B. L., Sims, M., Kanaya, A. M., Kandula, N. R., Fava, J. L., Loucks, E. B., Eaton, C. B., & Dulin, A. (2022). Social support, psychosocial risks, and cardiovascular health: Using harmonized data from the Jackson Heart Study, Mediators of Atherosclerosis in South Asians Living in America Study, and Multi-Ethnic Study of Atherosclerosis. SSM-Population Health, 20, 101284–101284. https://doi.org/10.1016/j.ssmph.2022.101284

16. Kang, H. (2021). Sample size determination and power analysis using the G* Power software. *Journal of educational evaluation for health professions*, 18.17
    DOI: https://doi.org/10.3352/jeehp.2021.18.17

17. Kuper, H., Adami, H.-O., Theorell, T., & Weiderpass, E. (2006). Psychosocial Determinants of Coronary Heart Disease in Middle-Aged Women: A Prospective Study in Sweden. American Journal of Epidemiology, 164(4), 349–357. https://doi.org/10.1093/aje/kwj212

18. Orth-Gomér, K., Schneiderman, N., Wang, H. X., Walldin, C., Blom, M., & Jernberg, T. (2009). Stress reduction prolongs life in women with coronary disease: the Stockholm Women's Intervention Trial for Coronary Heart Disease (SWITCHD). *Circulation: Cardiovascular Quality and Outcomes*, 2(1), 25-32. https://doi.org/10.1161/circoutcomes.108.812859

19. Rosengren, A. (2004). Coronary disease in relation to social support and social class in Swedish Men A 15-year follow-up in the study of men born in 1933. European Heart Journal, 25(1), 56–63. https://doi.org/10.1016/j.ehj.2003.10.005

20. Sharif, M., Zaidi, A., Waqas, A., Malik, A., Hagaman, A., Maselko, J., LeMasters, K., Liaqat, R., Bilal, S., Bibi, T., Ahmad, I., Sikander, S., & Rahman, A. (2021). Psychometric validation of the multidimensional scale of perceived social support during pregnancy in rural Pakistan. *Frontiers in Psychology,* 12. https://doi.org/10.3389/fpsyg.2021.601563

21. Shumaker, S. C., Frazier, S. K., Moser, D. K., & Chung, M. L. (2017). Psychometric Properties of the Multidimensional Scale of Perceived Social Support in Patients with Heart Failure. *Journal of Nursing Measurement*, 25(1), 90–102. https://doi.org/10.1891/1061-3749.25.1.90

22. Staniute, M., Brozaitiene, J., & Bunevicius, R. (2013). Effects of Social Support and Stressful Life Events on Health-Related Quality of Life in Coronary Artery Disease Patients. The Journal of Cardiovascular Nursing, 28(1), 83–89. https://doi.org/10.1097/jcn.0b013e318233e69d

23. Su, S.-F., Chang, M.-Y., & He, C.-P. (2018). Social Support, Unstable Angina, and Stroke as Predictors of Depression in Patients with Coronary Heart Disease. Journal of Cardiovascular Nursing, 33(2), 179–186. https://doi.org/10.1097/jcn.0000000000000419

24. Tsao, C. W., Aday, A. W., Almarzooq, Z., Alonso, A., Beaton, A., Bittencourt, M. S., Boehme, A. K., Buxton, A. E., Carson, A. P., Commodore-Mensah, Y., Elkind, M. S., Evenson, K. R., Eze-Nliam, C., Ferguson, J. F., Generoso, G., Ho, J. E., Kalani, R., Khan, S. S., Kissela, B. M., . . . Martin, S. S. (2022*). Heart Disease and Stroke Statistics—2022 Update*: A Report from the American Heart Association. *Circulation*, 145(8). https://doi.org/10.1161/cir.0000000000001052

25. Wenn, P., Meshoyrer, D., Barber, M., Ghaffar, A., Razka, M., Jose, S., Zeltser, R. and Makaryus, A.N., (2022). Perceived Social Support and its Effects on Treatment Compliance and Quality of Life in Cardiac Patients. *Journal of Patient Experience.* 2022; 9:237437352210741. https://doi.org/10.1177/23743735221074170

26. World Bank Country and Lending Groups – World Bank Data Help Desk. (n.d.). Datahelpdesk.worldbank.org. https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-

27. World Health Organization. (2021). *Cardiovascular diseases (cvds)*. https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds)

28. World Health Organization. (2020). The top 10 causes of death. Fact sheet. www.who.int/mediacentre/factsheets/fs310/en/

29. Zimet, G.D., Dahlem, N.W, e, S.G., & Farley G.K. (1988). The Multidimensional Scale of Perceived Social Support. *Journal of Personality Assessment*, 52(1) ,30-41. https://doi.org/10.1207/s15327752jpa5201_2

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