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ORIGINAL PAPER

Interplay of Self-efficacy and Social Support in Predicting Quality of Life in Cardiovascular Patients in Pakistan

Shameem Fatima[1] · **Tahira Jibeen**[2]

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Abstract

The primary objective of the present study was to assess independent and interactive relations of perceived social support and self-efficacy with four quality of life (QOL) domains namely physical, psychological, social, and environmental in cardiovascular disease (CVD) patients from a South Asian region. Participants were 172 (age 22–60 years) patients recruited from three major government sector hospitals from the fifth biggest city of South Asia. It was found that overall CVD patients had a better QOL in psychological and environmental domains compared to social and psychological. Furthermore, findings from hierarchical regression analyses indicated that perceived social support and self-efficacy were positively associated with the four QOL domains. Besides main effects, a synergistic interaction between social support and self-efficacy emerged indicating that perceived social support was strongly associated with physical and social QOL in CVD patients who had higher self-efficacy levels, while, perceived social support was weakly associated with the physical and social QOL in CVD patients who had lower self-efficacy levels.

Keywords Perceived social support · Self-efficacy · Quality of life · Cardiovascular patients

Cardiovascular disease (CVD) is a major and a rising health problem worldwide; and in next few decades, half of the world's cardiovascular burden is predicted to occur in Asian-Pacific region (Gaziano et al. 2006; Martiniuk et al. 2007; Pillai and Ganapathi 2013). Although CVD is a major cause of mortality, morbidity, and deterioration of quality of life(QOL), unfortunately, relatively few studies so far have targeted issues concerning QOL in CVD patients in developing countries (The World Health Organization 2002). To address this gap, the study analyzes the QOL and its psychosocial determinants in South Asian CVD patients.

Currently, medical care is focused around optimizing the QOL of patients to manage the effects of chronic diseases (Johansson et al. 2004). Regarding cardiac rehabilitation, the American, the European, and the Australian (American Association of Cardiovascular and Pulmonary Rehabilitation 2013; Goble and Worcester 1999; Graham 2007) guidelines highlight the importance of psychosocial factors to improve patients' QOL. The literature (e.g., Dracup et al. 1992) suggests that clinical symptoms associated with heart diseases affect QOL through impact on physical functioning, psychological qualities, and social relationships.

Previous studies indicate that perceived QOL is determined by the psychosocial factors such as social support and self-efficacy, and socio-demographic factors in cardiac patients (e.g., Duenas et al. 2011; Veenstra et al. 2004). Among psychosocial factors, a supportive interpersonal environment has been described as an important factor that is likely to facilitate patients' adaptation to life-threatening and chronic illnesses (Gallant 2003; Reblin and Uchino 2008), and to improve QOL in cardiac patients (Lett et al. 2005; Molloy et al. 2008; Orth-Gomer 2000).

Self-efficacy beliefs play an active role in tackling illness consequences; people with higher self-efficacy levels are more likely to engage in behaviors that are beneficial to their health than are those with lower self-efficacy levels (Arnold et al. 2005; Brink 2009; Bandura 2000, 2004). For example, in cardiac patients, self-efficacy has been found to

✉ Shameem Fatima
shameem_pu@hotmail.com

Tahira Jibeen
tahiraimdadali@yahoo.com

[1] Department of Humanities, COMSATS University Islamabad, Lahore campus, Defence Road, Off Raiwind Road, Lahore, Pakistan

[2] Department of Psychology, University of Management and Technology, Lahore, Pakistan

be positively associated with QOL, self management, and psychological well-being (e.g., Joekes et al. 2007; Sarkar et al. 2007).

Social cognitive theory integrates individual cognitions and social resources to explain why some individuals with same disease severity have better QOL and others do not (Brawley et al. 2000; Woodgate et al. 2007). The theory describes that self-efficacy is expected to moderate the effects of social support on health related behaviors through various possible interactions (Bandura 1997). Firstly, self-efficacy is likely to interact with social support in a synergistic way (Buckworth and Dishman 2002; Dishman et al. 2009; Warner et al. 2011), that is, as level of self-efficacy increases, perceived social support becomes a stronger predictor of physical exercise/QOL and vice versa. Secondly, self-efficacy may also compensate for low social support (e.g., Hamilton et al. 2017), that is, individuals who perceive low social support may benefit from high self-efficacy to enhance QOL.

Research Gaps and the Current Study

The present study intends to add to the literature on health psychology by investigating QOL and its psychosocial determinants in South Asian CVD patients. In spite of the rising rates of CVD problems in developing countries (Pillai and Ganapathi 2013; Gaziano et al. 2006), a few studies have been carried out in developing countries of the South Asian region (WHO 2002) to identify the specific psychosocial resources that may act as protective factors in decreasing the effects of illness and improving QOL. Furthermore, the past studies in developed countries which have assessed the role of social support or self-efficacy in QOL are largely based on the European samples and they have not focused on the multidimensional aspects of QOL. Moreover, they have not considered CVD patients, and particularly, have not studied the interaction between self-efficacy and perceived social support. Although social cognition theory (Bandura 1997) allows us to formulate a hypothesis about the interplay of personal and social resources, yet no empirical support for the interaction effect is present in the previous literature on CVD patients particularly from South Asian region. Therefore, a primary aim of the study was to assess QOL using both within subject component to assess differences across four QOL domains and between group differences across gender and marital status. A secondary aim was to examine both main and interaction effects of self-efficacy and perceived social support after controlling the demographic and clinical effects (e.g., Barbareschi et al. 2011; Duenas et al. 2011; Veenstra et al. 2004) on the four QOL domains (physical, psychological, social, and environmental) in the CVD patients.

Method

Participants

There were 172 participants (males and females) with cardiovascular problems, selected from cardiac in wards of three major government hospitals from the fifth biggest and a cosmopolitan city of South Asia. The researchers included only those participants who had been diagnosed with a cardiovascular problem, were inpatients, on medication, and both males and females. Exclusion criteria included co-morbidity with any other physical or mental disorder, and/or any terminal illness (e.g., cancer or any other end stage diseases). The study was primarily aimed at assessing independent and interactive effects of self-efficacy and social support, therefore, any co-morbid mental or physical condition that is likely to affect QOL in CVD patients was considered confounding factor, and thus, controlled.

Data were collected between time periods from January 2015 till August 2015. On the whole 270 participants were screened according to the predetermined including and excluding criteria, but only 237 participants initially agreed to participate. They were clearly informed about the nature and purpose of the study. Participation in the study was voluntary and only those patients who consented to be the part of study were included in the study. Though 237participants initially agreed to participate, but only 198 formally consented to provide data. However, the researchers were unable to obtain data from 198 participants due to various reasons (e.g., missing scheduled meeting with the researchers could not complete all scales, or few went on leave etc.). Final data included 172 participants who completed the measures of perceived social support, self-efficacy, and QOL.

Participants were in the age range of 22–60 years ($M = 46.92$, $SD = 5.83$), of both genders (74% men, 26% women), with a mean of 4.8 years of education (from 3 to 12 years of education). Eighty-five percent of the participants were married and the rest were single. Further, 78% were working and 22% were non working (38 out of total 43 non working participants were female housewives and three were students). In accordance with the Pakistan Bureau of Statistics (1998), 80% of working patients had low income and non skilled professions (requiring little education and skilled training), 12% had medium income professions, and only 8% had some senior professional job. Thirty-two percent of the participants had been diagnosed during last 1 month prior to participation in the study, 22% were diagnosed during last 1 year, but earlier than 1 month, 16% were first diagnosed during last 5 years, and remaining were diagnosed for more than 5 years.

Instruments

Demographic and Medical Variables

A structured questionnaire was constructed by the researchers to obtain information about participants' demographic (i.e., age, gender, education, marital status, income, ethnicity etc.) and medical (e.g., date of first diagnosis, duration of CVD, recurrence etc.) history.

The General Self-efficacy Scale (Schwarzer and Jerusalem 1995)

The Urdu version (Tabassum et al. 2003) was used to assess a general sense of perceived self-efficacy for dealing with challenging and demanding life tasks. The scale consisted of 10 items and used a 4-point response format. For scoring, responses to the10 items were summed to yield a final composite score with a range from 10 to 40, with higher scores indicative of greater perceived self-efficacy. Cronbach alpha (0.98) in the current study was very good.

The Multidimensional Scale of Perceived Social Support (Zimet et al. 1988)

The Urdu version (Jibeen and Khalid 2010) consisting of 12 items assessed perceived social support from family, friends, and a significant other. Respondents responded to items on a 7-point Likert scale, ranging from very strongly disagree (1) to very strongly agree (7). Composite score of perceived social support was obtained by summing the scores on all items comprising the scale. Cronbach alpha in the present study was 0.90 for full scale.

The World Health Organization Quality of Life Assessment Instrument—Short Version (WHOQOL-BREF; Fleck et al. 2000)

The Urdu version of WHOQOL-BREF (Khan et al. 2003) was used to assess QOL of the CVD patients. Comprising 26 items, the scale assessed two general indexes of perceived QOL and perceived health status from first two items, and four QOL domains namely physical, psychological, social, and environmental from remaining 24 items. The scale used a five point response format for all items. Raw scores on items were converted into transformed scores to range from 4 to 20. The higher scores on each of these four domains represented greater perceived QOL in the respective domain. The internal consistency coefficients as found in the current study were 0.88, 0.75, 0.73, and 0.80 for physical, psychological, social, and environmental domains respectively.

Procedure

This study was approved by the Departmental Research Review Committee, COMSATS University Islamabad, Lahore. Following the ethics approval procedure, initial contacts were made with the heads of cardiac departments of three government hospitals in Lahore, to get formal permission. After obtaining approval from heads of the cardiac departments, potential participants were screened by medical doctors and by medical records.

Eligible participants were asked about their willingness to participate and they were assured of the confidentiality of their information. Data were collected using face to face administration of survey questionnaires. Data were collected in one sitting using face to face administration of survey questionnaires. As Urdu is the native language of the Pakistani nationals, therefore, the researchers used only the Urdu translated versions of all scales. All of the participants were able to read the questionnaires. Additionally, the researchers were there to answer any query raised by the respondent.

Data Analysis Plan

Descriptive statistics and Pearson correlations were calculated between the study variables. Next, the data analysis proceeded in three ways. First, a repeated measure *t* test was computed to analyze within subject differences across two general dimensions (general QOL & general health) assessed from first two items on WHOQOL-BREF. Second, a repeated-measure ANOVA evaluated the four QOL domains as within-subject factor, and gender and marital status as between-group factors, using age and disease duration as co variables. Third, a hierarchical regression approach was used to predict four QOL domains from perceived social support, followed by self-efficacy, and finally from an interaction between self-efficacy and perceived social support after taking into account the potential demographic and clinical effects.

Results

Table 1 presents descriptive statistics and correlations between the study variables. Inter scale correlation between the four QOL domains derived from WHOQOL-BREF ranged from good to moderate (0.70–0.47) indicating that each of these factors relates to same general domain, but represents some independent aspect of this general domain. General QOL and general health as assessed from two complimentary items on WHOQOL-BREF also showed

Table 1 Descriptive statistics and correlations between study variables

	M	SD	α	SS	SE	GQOL	GH	Phy	Psy.	Soci.	Env.
SS	59.75	14.85	.88	–	.11	.49***	.40***	.42*	.50***	.50***	.43***
SE	26.79	6.36	.98		–	.16*	.14	.18*	.30***	.16*	.20**
GQOL	3.51	.84	–			–	.43***	.31***	.58***	.38***	.43***
GH	2.76	.87	–				–	.37***	.49***	.32***	.43***
Phy. QOL	10.16	2.37	.88					–	.58***	.69***	.68***
Psy. QOL	13.15	2.01	.75						–	.47***	.70***
Soci. QOL	10.41	2.35	.74							–	.57***
Env. QOL	12.18	2.26	.80								–

SS social support, *SE* self efficacy, *GQOL* General Quality of Life; *GH* general health, *Phy* physical, *Psy* psychological, *Soci* social, *Env* environmental

*p < 0.05; **p < 0.01; ***p ≤ 0.001

moderate correlations with four QOL domains. Social support was significantly and highly correlated with two general domains (QOL & health) and with all four QOL domains. Self-efficacy was also significantly correlated with all four QOL domains and with general QOL but not with general health.

Within Subject Differences Across General QOL and General Health

Within subject differences across general QOL and general health were calculated using repeated measure *t* test. Significant *t* test statistics ($t = 6.43$, $p < 0.001$, df = 170) indicated that CVD patients perceived a significantly better general QOL (M = 3.51, SD = 0.84) than general health (M = 2.76, SD = 0.87).

Within Subject Differences Across Four QOL Domains Using Gender and Marital Status as Between Subject Factors

Transformed scores on QOL domains were analyzed using 4 × 2 × 2 way ANOVA with QOL domains (4 levels: physical, psychological, social, & environmental) as a within subject factor, and gender (2 levels: male & female) and marital status (2 levels: married & single) as between subject factors. Two factors namely age and duration of disease were co-varied in these analyses. After considering the violation of sphericity assumption [χ^2 (5) = 11.59, p < .04] the degrees of freedom were corrected using Greenhouse–Geisser (ε = 0.95). There was a significant main effect of QOL domains [F (3, 166) = 3.99, $P < .01$, $\eta^2 = 0.03$] with better QOL in psychological (M = 13.09, SD = 2.02) and environmental (M = 12.16, SD = 2.31) domains as compared to physical (M = 10.22, SD = 2.44) and social (M = 10.44, SD = 2.41) domains.

Further, analyses of between group differences did not show main effects of gender and marital status. However, interaction effect of gender with four QOL domains was significant [F (3, 166) = 11.30, $P < 0.001$, $\eta^2 = 0.07$] with females showing better environmental related QOL (M = 13.67, SD = 2.12) than males (M = 11.88, SD = 2.27). Also, marital status was found to have a significant interaction with QOL domains [F (3, 166) = 4.78, $p < .05$, $\eta^2 = 0.02$] with married patients showing better social QOL (M = 11.32, SD = 2.84) than unmarried patients (M = 10.20, SD = 2.29).

As age and duration of disease are likely to co-vary with QOL, therefore, these factors were analyzed as co-variables in ANOVA. Main effects of age and disease duration on QOL were not significant, however, results showed that both the age [F (3, 166) = 7.39, $P < 0.001$, $\eta^2 = 0.04$] and disease duration [F (3, 166) = 7.06, $P < 0.001$, $\eta^2 = 0.04$] significantly interacted with QOL domains. Descriptive statistics showed greater age differences in QOL at physical, psychological, and social level (lower physical and social, and higher psychological QOL in older patients). Furthermore, result showed better psychological and environmental QOL in patients suffering from disease since longer duration.

Independent and Interactive Effects of Self-efficacy and Social Support on QOL

The relative contributions of social support and self-efficacy in predicting four QOL domains were calculated from hierarchical regression analyses. At first step, demographic and medical variables (age, gender, marital status, education, income, & duration of disease) were entered as predictors; at second step, social support was added in the equation; at third step, self-efficacy was added; and at fourth step, an interaction term (social support × self-efficacy) was added to assess whether each of these predictors significantly increased the variance.

Table 2 Standardized regression weights showing moderation effects of self efficacy on the relation between social support and QOL in CVD patients

Predictors	Quality of life aspects															
	Physical				Psychological				Social				Environmental			
	M 1	M 2	M 3	M 4	M 1	M 2	M 3	M 4	M 1	M 2	M 3	M 4	M 1	M 2	M 3	M 4
Age	−0.19	−0.12	−0.07	−0.08	0.14	**0.21***	**0.24****	**0.24****	−0.19	−0.10	−0.08	−0.07	0.001	0.07	0.10	0.10
Gender	0.02	0.06	0.05	0.03	0.09	0.15	0.15	0.14	−0.02	0.02	0.03	−0.004	0.22*	**0.25****	**0.26****	**0.24****
MS	−0.002	0.05	0.11	0.05	−0.04	0.02	0.08	0.06	0.14	**0.20***	**0.24****	**0.18***	0.002	0.05	0.11	0.07
Education	0.05	0.12	**0.18***	**0.20***	0.22*	0.15	0.08	0.08	0.15	0.07	0.01	−0.01	0.02	−0.05	−0.12	−0.13
Income	0.14	0.07	0.05	0.01	**0.18***	0.10	0.08	0.06	**0.21***	0.13	0.10	0.07	**0.14**	0.07	0.04	0.02
Dis. Dur	−0.01	−0.003	−0.01	−0.01	0.09	0.09	0.08	0.08	−0.16	**−0.16***	**−0.17***	**−0.16***	0.09	0.09	0.08	0.08
SS		**0.42*****	**0.42*****	−0.49		**0.47*****	**0.47*****	0.13		**0.53*****	**0.52*****	−0.33		**0.43*****	**0.43*****	−0.21
SE			**0.22****	−0.59			**0.22****	−0.08			**0.20****	−0.57			**0.22****	−0.35
SS × SE				**1.28***				0.47				**1.21***				0.90
R^2	0.04	0.20	0.24	0.28	0.16	0.37	0.41	0.41	0.13	0.39	0.42	0.45	0.8	0.25	0.29	0.31
Incremental R^2	–	**0.16**	**0.04**	**0.04**	–	**0.21**	**0.04**	0.00	–	**0.26**	**0.03**	**0.03**	–	**0.17**	**0.04**	0.02
Model fit	F (170, 6) = 0.90	F (170, 7) = 4.77***	F (170, 8) = 5.29***	F (170, 9) = 5.52***	F (170, 6) = 4.29**	F (170, 7) = 10.83***	F (170, 8) = 11.23***	F (170, 9) = 10.09***	F (170, 6) = 3.36**	F (170, 7) = 12.07***	F (170, 8) = 11.99***	F (172, 9) = 11.87***	F (170, 6) = 1.89	F (170, 7) = 6.29***	F (170, 8) = 6.72***	F (170, 9) = 6.40***

SS social support, *SE* self efficacy, *Dis. Dur*. disease duration

*p < .05, **p < .01, ***p < 0.001, significant beta weights are in bold type

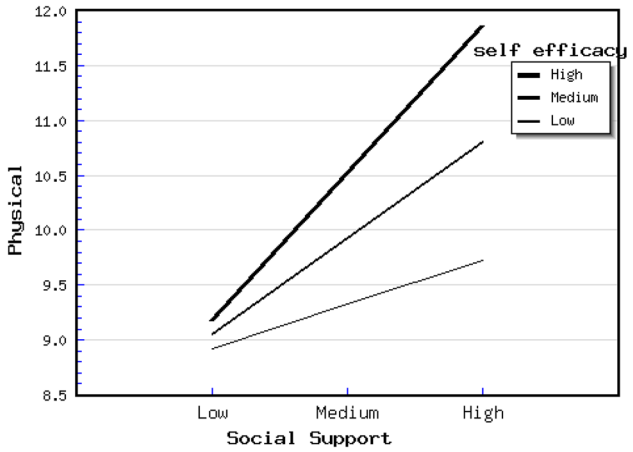

Fig. 1 Showing the effect of social support on physical quality of life moderated by self efficacy

Physical QOL

Table 2 indicates that social support contributed a significant increase in variance explained over demographics alone to predict physical QOL from 4 to 20% in model 2. Self-efficacy contributed further to the variance explained from 20 to 24% in model 3. Significant beta weights of social support and self-efficacy indicate that patients perceiving more social support and having higher self-efficacy beliefs are likely to experience better physical QOL. The interaction between self-efficacy and social support also increased the predictive power from 24 to 28% in the final model. Figure 1 constructed by Modgraph-Internet version (Jose 2013) clearly shows that in CVD patients with higher self-efficacy levels, social support strongly predicts physical QOL as compared to CVD patients with lower self-efficacy levels for whom social support weakly predicts QOL, thus favoring the synergistic view.

Psychological QOL

In predicting psychological QOL, the second model, when social support was added in the equation, yielded a significantly large increase in variance explained from 16 to 37% (incremental variance = 21%). Self-efficacy also contributed significantly to increase the variance explained in the third model from 37 to 41%. However, interaction of social support and self-efficacy was not a significant predictor in the fourth model. Further, analyses indicate that in addition to social support and self-efficacy, age was also a positive predictor of psychological QOL. Same is supported by ANOVA output as described earlier in result section.

Social QOL

In predicting social QOL, social support and self-efficacy contributed significant increase in variances explained in models 2 and 3 from 13 to 39 and from 39 to 42% respectively. Among demographics, marital status and disease duration were significant predictors of social QOL. Findings indicate that CVD patients who were married, had been experiencing CVD disease for less duration, had higher self-efficacy levels and perceived more social support were more likely to experience better QOL in social domain. The interaction between self-efficacy and social support was also a significant predictor. Figure 2 indicates a synergistic interaction, that is, as the level of self-efficacy increased, the power of perceived social support to predict social QOL also increased.

Environmental QOL

Social support and self-efficacy contributed significantly to increase the variance explained in the second and third model from 8 to 25 and 25–29% respectively. However, interaction of social support and self-efficacy was not a significant predictor in the fourth model.

Discussion

This study presents a comprehensive analysis of QOL in a sample of CVD patients from an understudied South Asian region by analyzing both within subject and between subject effects. It was found that the CVD patients had significantly higher perceptions of their general QOL than their general health. Additionally, the results indicated that the CVD patients had significantly better psychological and environmental QOL compared to physical and social QOL.

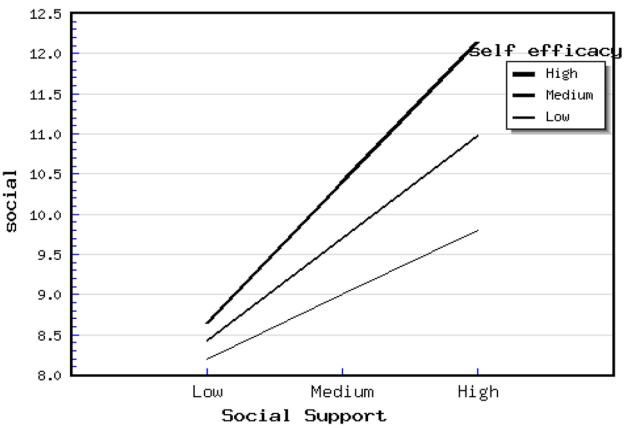

Fig. 2 Showing the effect of social support on social quality of life moderated by self efficacy

This most likely indicates their psychological resilience to adjust to threatening conditions despite the presence of challenging physical illness. Notably, the sample was recruited from government sector hospitals and belonged to a relatively lower SES as evident from lower educational and income levels of the sample as described in sample demographics. Insufficient resources and lack of access to proper medical facilities may be some of the reasons for poor physical QOL. Empirical support for the finding is present both from Western and Asian cultures (e.g., Barbareschi et al. 2011; Malik and Afzal 2015; Murberg and Bru 2001). The social QOL was also compromised in the CVD patients may be due to restricted mobility or actual or perceived disruption in social support system which may take on various forms such as difficulty in making friends, losing friends, being unable to join social activities etc. (e.g., Compare et al. 2013).

Interaction effects with demographics indicated that females perceived better environmental QOL, and married participants perceived better social QOL. Though, empirical support for the findings is present from the Western perspective comprising individualistic culture (e.g., Duenas et al. 2011; Williams et al. 1992), the findings are particularly important in the cultural context of Pakistan. As compared to the gender equality perspective of the Western culture, males in the patriarchal culture of Pakistan are generally considered to be responsible to meet environmental family needs; and with a physical burden of CVD, they may find it difficult to manage the environmental needs of the family. On the other hand, females may not assume responsibility for the environmental family needs as they are provided with enough resources (e.g., medical care, free time) to combat the effects of physical illness from a healthy partner. In the collectivistic culture of Pakistan, married patients perceive better social QOL as in addition to spousal support they may receive social support from extended social circles including partner's family and friends (Kulik and Mahler 1993; Molloy et al. 2008).

The present study indicated that participants higher in age were found to have lower physical and social QOL, while better psychological QOL pointing that increasing age usually brings the burden of low physical immunity, decreased metabolic processes to affect physical QOL and restricted mobility to affect social QOL as supported in the cultural context of Pakistan (Malik and Afzal 2015). Likewise, previous literature (e.g., Veenstra et al. 2004) supports improved mental and psychological QOL in elderly and this may be due to the usual onset of chronic diseases in elderly that is probably less troublesome than in youth. Additionally, with the increasing disease duration, the CVD patients were more likely to report better psychological and environmental QOL. It is quite likely that patients make adjustments in their environmental conditions to cope with their physical limitations and become psychologically more resilient while suffering from chronic diseases.

Independent and Interactive Effects of Self-efficacy and Social Support

As hypothesized, the findings indicated that perceived social support was a positive predictor of all QOL domains in the CVD patients. Consistent with previous literature (Bosworth et al. 2000; Lett et al. 2005; Reblin and Uchino 2008), the current findings suggest that the higher level of perceived social support provided by family, friends, and significant others positively predict QOL after considering demographics and the disease duration. It is important to note that perceived social support explains a large amount of variance in predicting the four QOL domains (26–16%). Multiple elucidations are likely to explain the positive predictive power of social support in explaining physical, psychological, social, and environmental QOL (Cohen et al. 1994). First, a well supported and a socially integrated CVD patient is probably subject to social control which facilitates adherence to healthy behaviors, compliance to medication, and meeting medical appointments, thus promoting physical QOL. Second, a higher perceived social support assists in the recognition of self worth resulting in a positive effect, thereby, increasing motivation for self-care, reducing psychological despair, and increasing psychological and social QOL. Third, increased social support may also provide tangible and economic support to cater medical treatment and related expenses, thereby, increasing physical and environmental QOL. Fourth, a higher perceived social support in terms of extended social network is likely to provide multiple sources of information with a greater probability to access more accurate information to deal with cardiac symptoms. Finally, consistent with stress buffering model, social support may protect CVD patients from potentially deteriorative effects of stressful situation of cardiac disease (Cohen and Wills 1985).

Similarly, self-efficacy emerged to be a significant predictor of all four QOL domains. Although the finding that self-efficacy positively predicted all QOL domains in the CVD patients is consistent with previous literature (Bandura 2004), however, the effect sizes were smaller than the perceived social support on the four QOL domains. Nonetheless, the effects of self-efficacy after perceived social support on all QOL domains are additive rather than compensatory that demonstrate self-efficacy as equally important factor as social support is for better QOL in the CVD patients.

Finally, results in the fourth model from regression analyses showed that self-efficacy significantly moderated the relations of perceived social support with physical and social QOL. That is, perceived social support strongly predicted physical and social QOL in patients who had higher levels

of self-efficacy and vice versa. Although social support itself is a positive resource factor for better QOL in CVD patients, its effect is dependent on and multiplies if combined with higher self-efficacy level. The findings lend support to the previous studies favoring synergistic interaction between self-efficacy and social support (e.g., Dishman et al. 2009; Warner et al. 2011) over compensatory view (Hamilton et al. 2017).

Many theoretically justified elucidations are likely to support the findings. First, patients with higher self-efficacy levels may benefit more from perceived support because their self-competent beliefs enable them to benefit from social support systems in seeking informational, social, and tangible support that may positively affect their physical and social QOL (Cohen et al. 1994). Additionally, a higher perceived social support as an essential positive resource may work as a social persuasion source to convert their self-efficacy believes into adaptable behavior (Bandura 2004).

Strengths, Limitations, and Implications

The current findings advance and build upon previous researches in many ways. First, key demographic variables were controlled in the study; therefore, the findings can be relied on more confidently that perceived social support and self-efficacy are positive resource factors for better QOL in the CVD patients. In addition, the findings are particularly important in that the sample was selected from an understudied and culturally diverse population group which is particularly vulnerable to cardiac diseases (Pillai and Ganapathi 2013; The World Health Organization 2002).

Limitations of the current study include the fact that the data were cross-sectional in nature, making it impossible to determine for certain the direction of causality. Additionally, variability in the functional impairment related to specific CVD diagnoses (e.g., coronary artery disease, heart failure, heart attack, arrhythmias, heart valve disease etc.) was not focused in the study, therefore, this methodological limitation should be focused in future studies.

Moreover, the present study assessed only positive social support as a resource for QOL. In future, it would be interesting to study comparative effects of positive and negative social support on QOL, because social relationships are not necessarily positive and supportive, rather relationships can also be negative and unsupportive (Rook 1984).

The current findings have implications for research and practice. First, results suggest that interventions designed to improve self-efficacy and enhance social relationships may lead to improved QOL in CVD patients. For example, interventions to improve social support and self-efficacy have reported hopeful results for improving QOL and decreasing physical and psychological symptoms in patients with chronic diseases (Hogan et al. 2002; Rajati et al. 2014). Second, the results of moderation analysis further implicate that rehabilitation and intervention programs should be designed to enhance self-efficacy of CVD patients so that they may better use social resources to maintain their QOL. The findings suggest that intervention strategies targeting social support for improving QOL in CVD patients should also consider cultivating self-efficacy to ensure that patients do not lack in personal and social resources to compete with such life threatening events. Further, keeping in view the lower educational levels of Pakistani nation, policies should be made at government level to raise the educational level in Pakistan; and health awareness campaigns focusing psychological interventions of cardiovascular problems can be run periodically in the public education system of Pakistan. Also, health awareness programs can be publicized using electronic media for participants having lower levels of education.

Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

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