



Sense of coherence and psychological well-being among coronary heart disease patients: a moderated mediation model of affect and meaning in life

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Abstract

There are credible data that the indirect relationship of sense of coherence with well-being can involve potential mediation and moderation mechanisms related to emotional and meaning-oriented factors. The self-concordance model provides a theoretical framework through which these associations can be examined. The current research explored whether the relationship between sense of coherence and well-being in people with coronary heart disease can be mediated by affect and simultaneously moderated by meaning in life. A total of 176 patients with coronary heart disease completed four questionnaires. Positive and negative affect turned out to mediate, though differently, the relationship between feelings of coherence and well-being. Furthermore, meaning in life moderated the indirect effect of sense of coherence to well-being only through positive affect. This confirmed the validity of a moderated mediation model of affect and meaning in life in associations between sense of coherence and well-being in people with coronary heart disease problems.

Keywords Sense of coherence · Psychological well-being · Coronary heart disease · Affect · Meaning in life

Introduction

Cardiac patients have drawn a considerable amount of attention in health psychology research as they tend to experience a number of psychological problems, i.e. anxiety, emotional distress, and tendencies towards negative thinking (Dekker 2011; Sundquist et al. 2016). Coronary heart disease (CHD) occurs when circulation to the heart is diminished, and it seems to be related to the accumulation of plaque on the inside of arteries. Zaninotto et al. (2016) pointed out that important factors regulating the psychosocial functioning of CHD patients are personality and well-being whose associations are often multifaceted. One of the personality traits which plays a significant role for CHD patients' mental and physical health is sense of coherence as it can imbue their life with feelings of confidence and hope (Julkunen and Ahlström 2006). However, there is little research to indicate the multifaceted relationship of sense of coherence with well-being, and what potential mediating and moderation effects are

responsible for its outcomes. It is thus highly needed to closely explore relations between sense of coherence and psychological well-being using the moderation-mediation framework of affect and meaning in life in CHD patients.

Essential Functions of Sense of Coherence for CHD Patients' Well-Being

One of the most important salutogenic constructs that accounts for health outcomes in cardiac patients is sense of coherence (Nahlén and Saboonchi 2010; Silarova et al. 2014). The construct was conceptualized by Antonovsky (1979) as a general attitude that represents the degree to which people possess a relatively stable and active feeling of having confidence regarding their existence. Individuals characterized by sense of coherence discern the quality of life in comprehensible, manageable, and meaningful terms (Krok 2015).

Although there is ample evidence demonstrating relationships between sense of coherence and well-being within various clinical groups (Pallant and Lae 2002; Kristofferzon et al. 2018), few studies directly examined this relationship among individuals with CHD. Furthermore, most studies applied the measure of quality of life which is a broader, though similar, construct than well-being. Examining patients with coronary bypass surgery, Dantas et al. (2002) revealed significant

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contribution of sense of coherence to the perceptions of quality of life. There was also the relationship of sense of coherence with life quality indices in individuals experiencing potential symptoms of cardiovascular disease (Julkunen and Ahlström 2006). Longitudinal research analyzing CHD patients who had coronary artery bypass procedures revealed consistent, positive relations between sense of coherence and life quality measures at baseline, after half a year and one year; individuals with low sense of coherence were characterized by worse quality of life in comparison with individuals with higher levels of coherence (Kattainen et al. 2006).

Due to conceptual similarities between life quality measures and well-being and their overlapping psychological functions, sense of coherence may play potential roles in CHD patients' well-being as it is likely to strengthen their mental processes by creating meaning and purpose. Sense of coherence offers deeper insight into daily events and prioritize goals which are also conducive to psychological well-being (Krok 2015; Ryff and Singer 2008). While experiencing emotional distress and uncertainty about ongoing health issues, those CHD patients who draw on sense of coherence can productively interpret daily events by assigning mental energies to important spheres of life. As a consequence, it can facilitate the personal qualities that are components of psychological well-being, i.e. important goals, valuable standards, and existential values.

Mediation and Moderation Effects of Affect and Meaning in Life

Although empirical results confirm associations between sense of coherence and different aspects of well-being, some important issues concerning their character and underlying mechanisms in CHD patients remain unanswered and still require further examination. Furthermore, the complexity of associations between the above constructs implies a high likelihood of mediation and moderation mechanisms.

There are studies demonstrating the mediating role of affect between various psychological factors and well-being, as well as connections among sense of coherence, affect, and well-being. Affect mediated the relationship between some beneficial characteristics of human functioning (forgiveness, gratitude, emotional intelligence) and well-being in the general population (Liu et al. 2013) and among people with mental problems (Toussaint and Friedman 2009). In heart failure patients, negative affect (related to depressive symptoms) turned out to mediate the association between coping and subjective well-being (Pérez-García et al. 2014). Negative affect (anxiety and depression) also mediated relationships between type D personality which has an inverse relation with feelings of coherence and general health measures of quality of life among individuals suffering from

coronary artery disease (Staniute et al. 2015). Sense of coherence also predicted affective reactions in people experiencing chronic heart failures (Nahlén and Saboonchi 2010). As regards the association of affect with well-being, Spindler et al. (2009) demonstrated the relationship of affect with quality of life and well-being measures among people suffering from cardiac dysfunctions; when adjustment was made for demographic and clinical characteristics, negative affect had associations with anxiety and depression, while positive affect – with well-being. In patients who had a heart attack, positive affect also predicted a lower level of PTSD (Bennett et al. 2001).

Furthermore, the question arises whether the above associations can be also moderated by factors related to the sphere of goals and values which, as mentioned above, have existential significance for CHD patients. There are studies implying a moderation function played by meaning in life which generally describes human endeavors and views of life as significant, purposeful, and valuable (George and Park 2017; Martela and Steger 2016). In women with dysfunctional personalities, meaning in life was a moderator of the association between suicide risk factors and hopelessness (Marco et al. 2017). In college students, meaning in life played a moderating role between stressful experiences and psychological well-being (Hong 2008). Meaning in life also moderated associations between perceived stress and coping in the sense that it prevented negative emotional reactions (Halama and Bakosova 2009). Searching for meaning moderated both the actual experience of life satisfaction and life satisfaction judgments (Steger et al. 2011), psychological distress (Szymanski and Mikorski 2016), and depression (Park and Jeong 2016). Although these studies were not directly conducted on people with serious physical illness, meaning in life in CHD patients who are characterized by a high level of negative emotional reactions is likely to moderate the indirect association between feeling of coherence and well-being, which occur through positive and negative affect.

The self-concordance model with its significant contribution to research on well-being (Kelly et al. 2015; Smith et al. 2011) appears a theoretically grounded framework that enables to analyze the relations among sense of coherence, well-being, and affect (Sheldon et al. 2004). According to its assumptions, goal striving predicts positive beliefs which ultimately relate to a higher level of well-being. The underlying assumption is based on consistent similarities between important goals and overall quality of life. People who pursue meaningful goals and apply meaning-making processes (e.g. those characterized by high sense of coherence) tend to attain a higher level of optimal goal striving and increase motivation. As a consequence, this process strengthens their actions leading to a stable and well-defined sense of accomplishment (Sheldon

and Cooper 2008). Concurrently, cognitive information processing which encompasses striving for goals and values generates affective states that predict the experience of life satisfaction. Thus, the model assumes that when people attain meaningful goals and confidence in their lives (i.e. sense of coherence), they tend to experience positive affect, which results in positive reactions in the sphere of well-being. In addition, more dynamic activities directed at achieving goals and meaning are likely to increase the level of well-being.

The Current Study

Previous research proposes that the relationship between sense of coherence and well-being is mediated by affect, but there are still areas that require further investigation. First, mediational relationships that can potentially occur within the dimensions of coherence, affect, and well-being were not examined in CHD patients. Second, meaning in life as a moderator was not investigated within these relationships. Taking into account the patients' specific characteristics, i.e. high uncertainty about the future outcomes, severe stress, or changes in daily affective states, we predicted that affect and meaning in life may play important mediational and moderation roles in the associations existing within the domains of coherence and well-being (see Fig. 1). Three hypotheses were formulated: (H1) Positive affect mediates the association of sense of coherence with psychological well-being; higher levels of sense of coherence are connected with stronger positive affect, which relates to greater psychological well-being, (H2) Negative affect mediates the relationship of sense of coherence with psychological well-being; higher levels of coherence are related to lower negative affect, which in turn relates to greater psychological well-being; (H3) The mediation processes are moderated by meaning in life (moderated mediation); the conditional indirect effects are stronger under conditions of higher meaning in life.

Method

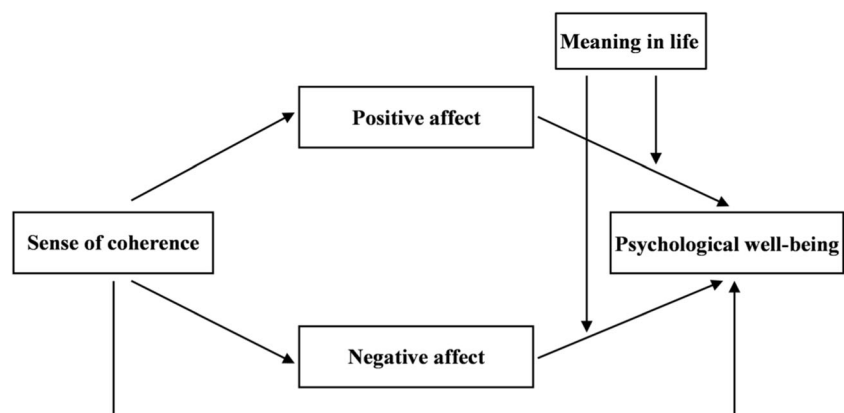
Participants

One hundred and seventy-six patients with CHD in the stable (CCS II, CSS III) and unstable forms took part in this study. Of these participants, 46.6% were female, 53.4% were male (mean age = 58.56, $SD = 8.25$). The following inclusion criteria were employed: medically confirmed diagnosis of CHD, ability to fill in a set of questionnaires in Polish, and willingness to sign informed consent. Excluded from participation were patients with: acute noncardiac conditions (e.g. serious mental problems, chronic physical illnesses), cognitive or mental incapacity to complete a set of questionnaires (e.g. vision problems, intellectual deficiencies), and medical contraindications that precluded accurate assessment. The sample comprised the following sub-groups: obstructive coronary artery disease (31.3%), heart failure and arrhythmia (45.4%), and heart dysfunctions (23.3%).

Procedure

Participants were recruited during their visits or stay in University Hospital (Opole, Poland). The group differed according to the severity of symptoms: 57.6% had scheduled check-ups, and 42.4% needed urgent admittance to the hospital. The participants were given information regarding the study, written informed consent, and a set of questionnaires. The hospitalized patients completed the questionnaires in hospital, whereas the ambulatory patients filled them in at home. Afterwards, research assistants gathered data and organized it. After the study participants were debriefed. In addition, a researcher was available if a patient wanted to receive any additional information. The research was accepted by University Ethical Board.

Fig. 1 The general moderated mediation model



Measures

The Sense of Coherence Scale measures how much an individual assesses one's life as comprehensible, manageable, and meaningful (Antonovsky 1993). The scale includes 29 items assessed from 1 to 7; the higher the score, the greater overall feeling of coherence. It contains three subscales: comprehensibility, manageability, and meaningfulness, with their sum representing the total result. Within the current sample the internal reliability for the total result was .82.

The Positive and Negative Affect Schedule evaluates two main affects: positive and negative, and 11 specific affective states (Watson and Clark 1999). It contains 60 items which are answered on a scale from 1 to 5 with reference to feelings in the past week. As the current study focused on measuring global affective states, only positive and negative affect subscales were chosen. Their internal reliabilities in the current sample were .83 and .85, respectively.

The Meaning in Life Questionnaire assesses: presence of meaning in life which evaluates how much individuals interpret their life in the category of meaningfulness, and search for meaning in life which assesses the extent of individual strivings to find meaning and purpose (Steger et al. 2006). Empirical research revealed a conceptual distinction between the two dimensions (Steger et al. 2011). Five items assess each of the subscales, and they are answered using a 7 point scale. As our study predominantly concentrated on individuals' experiences of meaning in life at the time, only the presence subscale was applied. Within the current sample the internal reliability for the presence subscale was .85.

The Psychological Well-Being Scale measures individuals' contentment and happiness (Ryff and Keyes 1995). It contains 42 items rated from 1 to 6. A high score represents a high level of psychological well-being which reflects a life imbued with autonomy, purpose, continued growth, acceptance, and satisfactory interactions with other people. The scale contains six subscales whose sum gives the total result. Within the current sample the internal reliability for the total result was .87; the internal reliabilities for the subscales ranged from .74 to .90.

Results

Preliminary Analyses

First, correlations were calculated among sense of coherence, psychological well-being, affect, and meaning in life. They are reported in Table 1. The effect size in the current sample was estimated on a basis of the total value of correlations (Cohen 1992).

Sense of coherence was positively associated with psychological well-being, positive affect, and meaning in life. In contrast, feelings of coherence were conversely linked with

negative affect. Psychological well-being which reflects a eudaimonic aspect of happiness showed positive relationships with positive affect and meaning in life; however, it conversely correlated with negative affect. As regards meaning in life, this factor correlated with both positive and negative affect; yet, their relations had opposite directions.

Multiple Mediation Analyses

The PROCESS Macro for SPSS version 21 was used to evaluate mediation and moderated mediation. To verify Hypotheses 1 and 2, mediation analysis was performed (Model 4) with the bootstrapping procedure recommended by Preacher and Hayes (2008). In line with their recommendations, both direct and indirect effects were assessed in accordance with the following conditions: samples = 5000; 95% bias-corrected confidence intervals.

Hypothesis 1 assumed that the association of sense of coherence with psychological well-being is mediated by positive affect; specifically, higher levels of feelings of coherence are associated with stronger positive affect, which then relates to greater psychological well-being. This hypothesis was fully confirmed with significant indirect effects (Table 2). The effect of sense of coherence on psychological well-being was significant on a basis of positive affect. The indirect path clearly demonstrates that sense of coherence relates to higher positive affect which is then related to greater psychological well-being.

Hypothesis 2 predicted that negative affect mediates the association between sense of coherence and psychological well-being; specifically, higher levels of feelings of coherence are related to lower levels of negative affect, which in turn relates to greater psychological well-being. The significant indirect effects confirmed this hypothesis (Table 2). Negative affect turned out to mediate the relationship of sense of coherence with psychological well-being. The direct effects evidently demonstrate that sense of coherence relates to lower negative affect which then is associated with higher psychological well-being.

In addition, a total indirect effect of coherence on well-being turned out to be mediated by both affects, which implies multiple mediation mechanisms. Positive and negative affect function in the form of simultaneous mediators. There was also a significant direct relation between sense of coherence and psychological well-being, indicating that the mediation was partial. As two mediations coexist in parallel and differ significantly in size, we used contrasts tests to assess the specific indirect effects of both kinds of affect within the association of sense of coherence with psychological well-being (Preacher and Hayes 2008). They revealed that the mediation through positive affect was significantly stronger than through negative affect ($Effect = .12$; $SE = .05$; 95% $CI = .03$ to $.21$).

Table 1 Descriptive statistics and correlations

Variables	<i>M</i>	<i>SD</i>	1	2	3	4	5
1. Sense of coherence	4.17	.68	–	.68***	.50***	–.51***	.58***
2. Psychological well-being	4.59	.66	.68***	–	.69***	–.52***	.62***
3. Positive affect	3.11	.63	.50***	.69***	–	–.31***	.52***
4. Negative affect	2.30	.66	–.51***	–.52***	–.31***	–	–.31***
5. Meaning in life	4.59	.85	.58***	.62***	.52***	–.31**	–

*** $p < .001$; ** $p < .01$

Moderated Mediation Analyses

To verify Hypothesis 3, moderated mediation analysis was performed (Model 14). The bootstrap method gauged whether: (1) meaning in life functions as a moderator in the indirect effect of feelings of coherence on well-being, (2) meaning in life as a moderator influences the indirect effect (Preacher and Hayes 2008). The sample data of 5000 with 95% bias-corrected confidence intervals were set to calculate the final results.

According to hypothesis 3, the mediation processes are moderated by meaning in life (moderated mediation); specifically, the conditional indirect effects are stronger under conditions of higher meaning in life. The moderated mediation analyses revealed significant direct effects, yet with different directions within the following three relations: negative affect and well-being (positive direction), meaning in life and well-being (positive direction), and sense of coherence and well-being (negative direction) (Table 3). In contrast, the relationship between positive affect and psychological well-being turned out to be insignificant. For psychological well-being, there were significant positive interactions on both paths: (1) positive affective reactions and meaning in life, (2) negative affective reactions and meaning in life.

More interesting results were obtained in moderated mediation indexes within which only the index for positive affect had a significant level (the confidence interval [.04; .15] of 95% did not include zero). This indicates that the mediational relationship of feelings of coherence with well-being including a mediating function of positive affect is also moderated by the structures of meaning and purpose. As regards conditional indirect effects, the result in high meaning in life conditions ($Effect = .27$; $Confidence\ Interval = .20$ to $.37$) was stronger than in low meaning in life conditions ($Effect = .13$; $Confidence\ Interval = .05$ to $.20$). On the contrary, moderated mediation was insignificant for the negative affect path as confidence intervals included zero ($Confidence\ Interval = -.15$ to $.01$). These results partially support Hypothesis 3 with significant interaction terms only for the positive affect path. Finally, comparison between the mediation and moderated mediation models revealed 5% of the variance explained in psychological well-being ($\Delta R^2 = .05$).

Discussion

This study aimed to verify a moderated mediation model which jointly examines two factors: affect as a mediator and

Table 2 Mediation estimates for affect in the relationship of sense of coherence with psychological well-being

Variables	<i>B</i>	<i>SE</i>	<i>t</i>	Model R^2
Direct effects				
Sense of coherence – Positive affect	.46	.06	7.68***	.25***
Sense of coherence – Negative affect	–.49	.06	–7.89***	.26***
Positive affect – Psychological well-being	.48	.06	8.86***	
Negative affect – Psychological well-being	–.21	.05	–4.01***	
Sense of coherence – Psychological well-being	.33	.06	6.14***	.66***
Indirect effects				
	<i>Effect</i>	<i>SE</i>	<i>LLCI</i>	<i>ULCI</i>
Sense of coherence – Positive affect – Psychological well-being	.22	.03	.16	.30
Sense of coherence – Negative affect – Psychological well-being	.10	.03	.04	.17
Total	.32	.05	.24	.43

*** $p < .001$

Table 3 Moderated mediation estimates for psychological well-being outcomes

Variables	<i>B</i>	<i>SE</i>	<i>t</i>	Model <i>R</i> ²
Direct effects				
Positive affect – Psychological well-being	–.38	.24	–1.59	
Negative affect – Psychological well-being	–.84	.27	–3.04**	
Sense of coherence – Psychological well-being	.25	.06	4.45***	
Meaning in life – Psychological well-being	–.71	.27	–2.59**	
Interaction: Positive affect x Meaning in life	.17	.05	3.39***	
Interaction: Negative affect x Meaning in life	.16	.06	2.34*	.71***
Conditional indirect effects				
	<i>Effect</i>	<i>SE</i>	<i>LLCI</i>	<i>ULCI</i>
Low meaning in life x positive affect	.13	.04	.05	.20
Mean meaning in life x positive affect	.20	.03	.14	.28
High meaning in life x positive affect	.27	.04	.20	.36
Low meaning in life x negative affect	.15	.04	.07	.23
Mean meaning in life x negative affect	.08	.03	.03	.14
High meaning in life x negative affect	.03	.05	–.07	.12
Index of moderated mediation				
Positive affect as a mediator	.08	.03	.04	.15
Negative affect as a mediator	–.07	.04	–.15	.01

****p* < .001; ***p* < .01; **p* < .05

meaning in life as a moderator in associations between sense of coherence and psychological well-being in CHD patients. It revealed interesting new moderated mediation models describing the cognitive and affective processes of people with heart dysfunctions. In line with our first hypothesis, positive affect mediated the association of feelings of coherence with psychological well-being. Sense of coherence reflecting a comprehensible, manageable, and meaningful life occurred to have positive associations with positive affective states which were then positively related to psychological well-being. A mediational pattern was also observed with regard to negative affect. However, the character of this mediation was different; sense of coherence demonstrated adverse connections with negative affective states which were then negatively connected to psychological well-being. This result supported our second hypothesis.

Taken together, the mediational effects of positive and negative affect are consistent with previous studies in which affect was an important mediator between positive personality-oriented characteristics and overall satisfaction with life in the general population (Liu et al. 2013) and among people with mental problems (Toussaint and Friedman 2009). Both these studies and the current study highlight the important role of affect in the sphere of general happiness and life satisfaction. Expanding previous results, our study is among the first to reveal the occurrence of multiple mediation affective mechanisms in the association between feelings of coherence and well-being among people experiencing serious heart dysfunctions. It also broadens our knowledge on the interplay

of cognitive judgments and emotional evaluations in CHD patients' experiences of well-being (King, and dela Rosa, E. D. 2019).

This study specifies that both kinds of affect operate simultaneously as partial mediators, which supports previous studies demonstrating the mediating effects of affect in a sample of undergraduate students (Extremera and Rey 2016) and also expands on research on sense of coherence and positive emotions (Hart et al. 2006), and on the relationship of affect with quality of life (Spindler et al. 2009) conducted among cardiac patients. It also stresses the fact that affective reactions, which are frequently observed in patients with cardiac dysfunctions serve an important function in the relationship of personality traits, i.e. sense of coherence with the sphere of fulfilment, personal values, and growth. Although positive and negative affect represent broad, general factors which are the dominant quasi-independent dimensions of emotional experience, CHD patients experience both at the same time not independently, but rather concurrently.

Another interesting finding was that positive affect turned out to have a significantly greater mediating effect in comparison with negative affect. This result is particularly valuable within the theory of positive emotions which may provide a constructive explanation for the important role of affect in CHD patients (Fredrickson 2001). The theory posits that increasing positive affect and reducing negative affect can broaden individuals' cognitive-behavioral abilities and build personal resources, which in turn can facilitate well-being. Positive affect appears especially effective and beneficial for mental health outcomes as it has the ability to alleviate some

of the detrimental effects of prolonged stress which are characteristic of CHD patients and contribute to the fulfilment of human potential, virtues, and self-realization which are at the core of psychological well-being (Fredrickson and Le Nguyen 2017; Ryff and Singer 2008). In other words, CHD patients may concentrate on positive aspects of their lives which naturally lead to experiencing positive affect in order to counterbalance the detrimental consequences of their illness, i.e. anxiety, distress, and negative thoughts. Although CHD patients are not devoid of negative affect – they frequently feel such emotions as anxiety and anger – finding potential opportunities to experience positive affect can reduce the adverse consequences of prolonged stress.

In addition to the mediational paths, our final model revealed important moderation effects. Meaning in life as a factor reflecting people's ability to discover significance and purpose in daily experiences was found to moderate the strength of the mediating connection between feelings of coherence and well-being, which occurs through positive affect. In contrast, meaning in life did not exert any moderation effect for the negative affect path. Thus, the findings only partially support our third hypothesis which initially assumed moderation effects for both positive and negative affect paths. This may suggest that positive affect differs from negative affect on the dimensions of purpose, meaning, and significance. As a consequence, the mediational effect of positive affect was greater for patients characterized by high levels of significance and meaning in comparison with those with low levels.

The above findings confirms previous findings regarding meaning in life in which purpose and significance demonstrated their indicative value for psychological well-being (Krok 2018; Steger et al. 2011). They also extend earlier results obtained within the dimensions of affect, meaning in life, and well-being (Hong 2008; Szymanski and Mikorski 2016) by specifying that meaning in life fulfils a core function in identifying daily experiences as significant and purposeful, which in turn can contribute to psychological well-being among CHD patients. This finding can be clarified on a basis of the self-concordance model by emphasizing close associations occurring between meaning structures and well-being. According to the model, CHD patients who perceive life as comprehensible and meaningful are characterized by higher levels of positive emotions, which then enhance the feelings of happiness and personal satisfaction. Encompassing important life goals and values, meaning in life provides CHD patients with the ability to more deeply understand and categorize their life events, positively reinterpret stressful situations, and constructively apply personal resources to daily challenges (Czekierda et al. 2017; Martela and Steger 2016). Meaning in life can be thus viewed in terms of 'the cognitive map' which equip people with a set of constructive abilities to discern relevant life outcomes, select potential plans, and conduct goal-related activities. As a consequence, CHD patients

who can successfully find meaning are able to increase their well-being on a basis of value-related growth and self-fulfillment.

The absence of the moderation effect for the negative path, which results in lower psychological well-being, may suggest that being overwhelmed with negative affect prevents CHD patients from making use of personal meaning structures to influence their well-being. Negative affect narrows attention and limits analytical focus (Clare and Storbeck 2006), which obstructs the patients' abilities to find significance and goals in their lives. Therefore, they cannot assimilate and incorporate existing meaning structures into daily life experiences. This interpretation is in line with King et al. (2006) who showed that negative affect had negative associations with meaning in life. Negative affect may result in decreasing one's ability to experience meaning and weakening one's motivation to formulate meaningful goals and values. As a consequence, CHD patients do not have sufficiently strong meaning structures which could help them build psychological well-being.

The present study has several limitations that warrant further discussion. First, our study used self-reported measures of affect. Although, the PANAS-X is a reliable method of assessing the subjective experience of affect (Watson and Clark 1999), its items might have not clearly shown positive and negative affect operating concurrently. As affect was measured at one point, it does not also allow us to determine whether participants gravitate more towards positive or negative affect. The current conclusions can then be viewed in relation to the durations aligned with the other questionnaires used in the study as the PANAS-X scales are sensitive to spontaneous emotional fluctuations. Second, the current study was cross-sectional, which invalidates any causal interferences. Although the hypothesized mediation and moderation relationships were conceptualized as causal, our model does not permit to draw causal inferences. Experimental or longitudinal designs could provide an empirical basis on which conclusions about causality or directionality can be drawn, e.g. how the mediating character of affective states may be influenced if they were assessed in the longer term. Third, meaning in life was measured as a unidimensional construct as this conceptualization was central to our study. There exist multidimensional measures of meaning in life that offer a wide spectrum of meaning-related constructs (Wong 1998). Their application could provide a broader vision of meaning in life and its constitutive elements (goals, purpose, and significance) in the domains of mental coherence, emotions, and life satisfaction. Future research can also employ narrative methodology which would enable it to obtain deeper insight into meaning-making processes.

In conclusion, our study confirmed the validity of a moderated mediation model of the two crucial factors: affective states and meaning structures influencing associations

between feelings of coherence and well-being among CHD patients. Positive and negative affective states were found to mediate the above association. Yet, their mediational effects were different: while positive affect strengthened the association, negative affect had an opposite effect. In addition, meaning in life moderated the connections of feelings of coherence with well-being only through positive affect. Contrary to our expectations, moderated mediation was insignificant for the negative affect. These moderated mediations demonstrated that having an overarching purpose in life and meaningful goals in conjunction with experiencing positive affect is beneficial to CHD patients' well-being expressed in terms of values and personal development.

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Data Availability The datasets analyzed during the current study are available in the OSF HOME repository, <https://osf.io/5wujz/>.

Compliance with Ethical Standards

Conflict of Interest The authors state that there are no competing interests.

Ethical Approval The study was conducted with the principles for research ethics required by The University Ethics Committee which approved the study: IEC - IP UO/07/10/2016. The study is also compliant with the 1964 Declaration of Helsinki and its later addenda.

Informed Consent The permission was obtained from research participants prior to completing questionnaires.

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