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Self-efficacy and Self-care Behaviors among Patients with Coronary Artery Disease in Jordan

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***Abstract*—** *This study purposed to assess the self-efficacy and self-care behaviors among patients with coronary artery disease in Jordan. A cross-sectional, descriptive correlational design was used the recruit 500 patients attending the cardiac outpatients' clinics in hospitals in different health sectors. Findings showed that the median of cardiac self- efficacy scales (patient-physician interaction scale (PEPPI-5), self-efficacy for managing chronic disease 6-item scale (SEMCD-6), and Sullivan's cardiac self- efficacy scale (SCSES)) were 20.00, 39.00, and 39.00, respectively. The participants' mean of the self-care behaviors was M=2.95 (SD=0.47). The PEPPI-5 demonstrated a positive correlation with social support (r (498) = 0.240, p < 0.001) and a negative correlation with educational level (p.b.r (498) = -0.130, p < 0.001). SEMCD-6 had a negative correlation with depression (r (498) = -0.169, p < 0.001), anxiety (r (498) = - 0.136, p < 0.05), and stress (r (498) = -0.129, p < 0.001), and positive relationship with social support (r (498) = 0. 224, p < 0.001). SCSES had a negative correlation with depression (r (498) = -0.096, p <0.05), anxiety, stress (r (498) = -0.091, p < 0.05), and marital status (p.b.r (498) = -0.097, p < 0.05). Also, SCSES had a positive correlation with social support (r (498) = 0.267, p < 0.001) and educational level (p.b.r (498) = 0.091, p < 0.05. Self-care behaviors had a significant a positive relationship with age (r (498) =0.178, p < 0.001), duration of disease (r (498) = 0.108, p < 0.05), and marital status (p.b.r (498) = 0.094, p < 0.05), while a negative relationship with anxiety (r (498) = -0.111, p < 0.05). There was a significant effect of PEPPI-5, SEMCD-6, and SCSES on self-care behaviors (B = 0.168, p < 0.001), (B = 0.037, p < 0.001), (B = 0.100, p < 0.001). Thus, more attention should be paid to correlating factors and working on eliminating the effects of these factors to help improve self-efficacy, which has the greatest influence on enhancing self-care behaviors.*

***Keywords*—** *Coronary artery disease, psychosocial factors, self-efficacy, self-care behaviors, demographic data.*

I. INTRODUCTION

Coronary artery disease (CAD) is one of the significant death-causing diseases worldwide (MalaKar et al., 2019). It involves the reduction of blood supply to the heart due to plague, win forms from cholesterol residues, and other components in the arteries. This plague leads to narrowing in the heart arteries, resulting in a partial or total blockage of the blood flow (Centers for Disease Control and Prevention, 2019). The well-documented indications of the underlying CAD are the appearance of angina or myocardial infarction. Patients with CAD usually suffer from various symptoms related to distinctive chest pain that transmits toward the neck, ears, jaw, wrists, arms, and possibly transfers into the shoulders, back, or abdomen (Duda-Pyszny et al., 2018). The World Health Organization (WHO) indicated that heart diseases are the leading cause of death worldwide. Nearly 17.7 million people died due to heart diseases, which constitute approximately 31% of all deaths worldwide, in which CAD was the leading cause of mortality among heart diseases (WHO, 2017). However, in Jordan, according to the WHO report in 2018, 37.0% of overall deaths are related to cardiovascular diseases, 22.97% of them are related to CAD (WHO, 2018). The significant predictors of CAD included diabetes, smoking, male gender (Al-Shudifat et al., 2017), and self-efficacy (Kang & Yang, 2013; O'Neil et al., 2013).

The CAD needs complex management alongside adherence to self-care behaviors (SCBs) including, prescribed medication and a healthy lifestyle. Self-care is explained as the realistic decision-making steps in choosing chronic illness prevention and management behaviors based on essential elements: self-care maintenance, monitoring, and management. These behaviors include a healthy diet and more physical activity (Riegel et al., 2017; Riegel & Dickson, 2008). Healthy behaviors are the most critical factors in reducing the potential risk of any disease and aiding in successful treatments or surgery (Jackson et al., 2014).

Also, SCBs are linked with many factors including, age (Mazar et al., 2020; Zinat Motlagh et al., 2016; Peyman et al., 2018; Tawalbeh et al., 2018; Tawalbeh et al., 2017; Xie et al., 2020), gender (Abootalebi et al., 2012; Asadi et al., 2019; Shojaee et al., 2009), educational level (Abootalebi et al., 2012; Asadi et al., 2019; Lee & Park, 2017; Shojaee et al., 2009; Tawalbeh et al., 2018; Tawalbeh et al., 2017), marital status (Abootalebi et al., 2012; Asadi et al., 2019; Shojaee et al., 2009; Tung et al., 2012), duration of disease (Beker et al., 2014; Tawalbeh et al., 2018; Tawalbeh et al., 2017), social support (Bahari et al., 2019; Hu et al., 2015; Gallagher et al., 2011; Lee & Park, 2017); depression (Chen et al., 2020; Kim et al., 2020), and anxiety (Celano et al., 2016).

Additionally, previous literature documented that self-efficacy positively affected SCBs (Bahari et al., 2019; Chen et al., 2020; Hu et al., 2015; Lee & Park, 2017; Ma, 2018; Peyman et al., 2020). Further, Tovar et al. (2016) found that self-efficacy may have a superior influence on self-care adherence.

Statement of the Problem

It has been reported that 40% of the patients with CAD experience severe psychiatric morbidity (Srivastava et al., 2017). The subjective pain may lead to some psych, logical

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disthe orders, including anxiety, which leads patients to fear unexpected death (Beltrami et al., 2017). Moreover, patients with CAD are highly susceptible to poor health-related quality of life due to sudden pain onset, poor social functioning, depression, and anxiety (Le et al., 2018). Otherwise, CAD-related symptoms can be unusual with the usual physical status of patience linked with poorer ability to walk and stairs climbing and perform basic daily activities, which could influent their SCBs (Nieuwenburg-van Tilborg et al., 2013).

Bailey et al. (2013) demonstrated that lower levels of self-efficacy provoke several risk factors for heart diseases; nearly 81.6% of participating patients had low levels of self-efficacy with several critical risk factors. Better self-efficacy through applying healthier lifestyle behaviors could improve the health status of patients with coronary heart diseases (Jackson et al., 2014; Wantiyah et al., 2020).

As a result of the increasing burden of CHD and the prevalence of comorbidities, it is necessary to study self-efficacy and SCBs among patients with CAD. It is essential to promote self-efficacy and examine whether enhancing self-effects modify health behaviors and improve quality of life. As well as highlighting the importance of nurses in improving the psychological status of patients including self-efficacy during the optimization of their self-care and health-related quality. Self-efficacy is essential for managing CAD risk factors; patients usually tend to neglect the role of unhealthy lifestyles and SCBs in disease progression.

Significance of the Study

Self-efficacy is an essential factor in initiating and maintaining health care behaviors. For this reason, this study is considered the first study in Jordan that assesses the self-efficacy and SCBs levels in patients with CAD and correlates demographic and psychosocial factors with self-efficacy. Thus, this study's findings would participate in the literature by providing information on self-efficacy and SCBs and elements connecting with these areas among patients with CAD.

This study would provide baseline information and appropriate assessment of self-efficacy and SCBs in patients with CAD in Jordan and their correlation with demographic and psychosocial factors, which may be necessary for healthcare professionals in setting priorities for developing health programs and strategies to enhance self-efficacy and SCBs among those patients.

In Jordan, few studies discussed the SCBs in heart failure (HF) (Tawalbeh et al., 2018; Tawalbeh et al., 2017). However, there is a noticeable gap in the knowledge regarding self-efficacy and SCBs among patients with CAD. This study addressed the critical topics not covered enough previously and narrowed down the knowledge gap.

Objectives of the Study

This study included the following purposes:

1- To assess the levels of self-efficacy and SCBs in patients with CAD in Jordan.
2- To examine the relationship between selected demographic variables (age, gender, educational level, marital status, income/month, and disease duration), psychosocial factors (depression, anxiety, stress, and social support), and self-efficacy in patients with CAD in Jordan.
3- To examine the relationship between selected demographic variables (age, gender, educational level, marital status, income/month, and duration of disease), psychosocial factors (depression, anxiety, stress, and social support), and SCBs in patients with CAD in Jordan.
4- To determine the predictors of self-efficacy in patients with CAD in Jordan.
5- To determine the predictors of SCBs in patients with CAD in Jordan.
6- To evaluate the effect of self-efficacy on SCBs among patients with CAD in Jordan.

Research Questions

The research questions that guide the study included the following:

1- What are the levels of self-efficacy and SCBs among patients with CAD in Jordan?
2- The relationship between selected demographic variables (age, gender, educational level, marital status, income/month, and duration of disease), psychosocial factors (depression, anxiety, stress, and social support), and self-efficacy in patients with CAD in Jordan?
3- What is the relationship between selected demographic variables (age, gender, educational level, marital status, income/month, and duration of disease), psychosocial factors (depression, anxiety, stress, and social support), and SCBs in patients with CAD in Jordan?
4- What are the predictors of self-efficacy in patients with CAD in Jordan?
5- What are the predictors of SCBs in patients with CAD in Jordan?
6- Is there an effect of self-efficacy on SCBs in patients with CAD in Jordan?

Definitions of the Study Variables

Conceptual Definitions

The conceptual definitions were evolved for the present study purpose, including the following:

- *Self-efficacy*: It is realized as the confidence in one's capacity to perform specific behaviors, and it has repeatedly predicted health behaviors in patients with CAD (Robichaud-Ekstrand, 2018).
- *Self-care Behaviors* refer to the therapeutic and lifestyle behaviors performed by patients with cardiac problems. These behaviors include choosing a low salt diet, controlling weight, taking prescribed medication, keeping doctors' appointments, practicing proper exercise, and monitoring symptoms (Tawalbeh et al., 2018).
- *Psychosocial Factors:* These factors denote the mental and the social elements in a person's life, for instance, depression, anxiety, stress, and social support (Pugh, 2002).
- *Depression*: It is a common mental disease is characterized by depressed mood, disturbed sleep or appetite, feelings of guilt or low self-worth, loss of interest or pleasure, low

energy, and poor concentration (American Psychiatric Association [APA], 2013).

- *Anxiety* has been defined as a subjective sense of unease, dread, or foreboding that can indicate a primary psychiatric condition. It can be described as an uncomfortable feeling of vague fear or apprehension accompanied by a characteristic physical sensation (APA, 2013).
- *Stress*: It has been defined as an adaptive response to an external situation that results in psychological, physical, and behavioral deviations for participants (APA, 2013).
- *Social Support* refers to the people's perceptions and beliefs that they are cared for and loved and have assistance from others. This support could come from many resources including, family, neighbors, friends, and others (French et al., 2018).

Operational Definitions

The operational definitions were evolved for this study involve the following:

- *Cardiac Self-efficacy (CSE):* It was assessed using three scales: 1) the 5-items perceived efficacy in patient-physician interaction scale (PEPPI-5), 2) the self-efficacy for managing chronic disease 6-item scale (SEMCD-6), and 3) Sullivan's cardiac self-efficacy scale (SCSES). The PEPPI-5 was developed by Henselmans et al. (2015) and consisted of five items, where items are scored from one (not at all confident) to five (very secure). The scoring system ranges from 5 to 25, in which higher scores indicate higher self-efficacy levels in patient-physician interactions. The SEMCD-6 was developed by Lorig et al. (2001) and composed of six items scored on a 10-points scale ranging from 1 = "not at all confident" to 10 = "totally confident." Total scores of this scale range from 6 to 60, whereas higher scores reflect higher perceived self-efficacy. Further, the SCSES was devolved by Sullivan et al. (1998) and consisted of 13 items. The scale items are rated from 0 (not confident) to 4 (entirely sure). This scale has two dimensions: control symptoms (eight questions) and maintaining functioning (five questions). For all scales of cardiac self-efficacy (CSE), the scoring system was according to the cut-off median, in which the scores less than median reflect low self-efficacy and ≥ median recall high self-efficacy (Barham et al., 2019).
- *Self-care Behaviors:* It was evaluated using Self-care of Coronary Heart Disease Inventory (SC-CHDI) version 3, developed by Vaughan et al. (2017). It consists of 23 items distributed on three sub-scales, involving self-care maintenance (9 items), management (8 items), and confidence (6 items). The self-care maintenance subscale items rated on a four-point Likert scale ranged from 1 (never) to 4 (always). In contrast, self-care management subscale items ordered on the scale went from zero (never) to 4 (very sure/always), and things of self-confidence subscale rated on a four-point Likert scale ranging from 1 (not sure) to 4 (very confident). The questionnaire score is between 16 and 88, which means that the higher score reflects the higher SCBs. The mean calculated the scores for the tools for the full scale, in which the mean scores more minor than the mean reflect low self-care and ≥ mean indicates high self-care.
- *Psychosocial Factors:* It is defined in this study as the psychological or social variables that might influence the study participants. It was assessed by investigating the participants' depression, anxiety, stress, and social support.
- *Depression, Anxiety, and Stress:* This factor evaluated set using the Depression, Anxiety, and Stress Scale at Lovibond and Lovibond developed (1995) to measure participants' psychological problems, namely, depression, anxiety, and stress. It is composed of three subscales: depression, anxiety, and stress. Each subscale consists of 14 statements that have been evaluated using the 4-point Likert scale ranging from 0 (not applicable) to 3 (very much, or most of the time, or a good part of the time). The levels of depression, anxiety, and stress subscales were calculated by summing up the scores for the relevant items to provide three scores for the three subscales. Possible scores for each subscale ranging from zero to 42, where the depression score was as follows: scores from 0 to 9 show no symptoms of depression, scores from 10 to 13 suggest mild depression, scores from 14 to 20 represent moderate depression, scores from 21 to 27 indicate severe depression, and scores from 28 and above reflect incredibly severe depression. However, the subscale of anxiety scored as follows: scores from 0 to 7 absence of fear, scores from 8 to 9 suggest mild anxiety, scores from 10 to 14 suggest mild anxiety, scores from 15 to 19 reflect severe anxiety, and scores from 20 and more represent extremely severe anxiety. In addition, the stress subscale scores are as follows: 0 to 14 do not reflect stress, scores from 15 to 18 represent mild stress, scores from 19 to 25 indicate moderate pressure, scores from 26 to 33 represent severe stress, and scores from 34 and more indicate incredibly extreme stress.
- *Social Support:* It was measured using the Multidimensional Social Support Scale (MSPSSwas developed by Zimet et al. (1988) to evaluate the awareness of social support. It consists of 12 statements that assess social support sources, including family, friends, and significant others. The system of scores for this measure ranges from 1 to 7, while the mean measure scores from 1 to 2.9 represent low social support, 3 to 5 indicate moderate social consent, and 5.1 to 7 show high social approval.
- *Demographic Data*: It involves gender, age, educational level, marital status, income /month, and duration of illness.

Summary

Coronary artery disease (CAD) is a major worldwide health problem. There is an increasing concern regarding the elevating prevalence rates of CAD. Few studies reported the significance of self-efficacy in maintaining health care behaviors and reducing the consequences of CAD. Otherwise, there is a knowledge gap related to psychosocial factors like anxiety, stress, depression, and social support. Thus, this study is considered the first study in Jordan that assesses the level of

self-efficacy and SCBs among patients with CAD, namely, depression, anxiety, stress, social support, and examining the correlation between demographic and psychosocial factors with self-efficacy and SCBs in Jordan.

- *Searching Process*

The key terms (Mesh) used in the searching process included cardiovascular diseases (CVDs), CAD, self-efficacy, SCBs, depression, anxiety, stress, social support, age, gender, material status, level of education, income, and income duration of illness. The following databases; EBSCO, CINAHL, Google Scholar, PubMed, and Science Direct databases were adopted for the searching process.

The criteria for selected articles included the period between 2007 and 2021 2021 for the lack of adequate studies about self-efficacy and SCBs in patients with CAD and were published in English. However, there were several exceptions for using old studies such as those relating to measurement methods and conceptual definitions and to cover some missing data that have not been identified within the specified time limits.

Some publications were omitted during the review because of not focus on CVDs and particularly CAD among patients and were not English.

- *Previous Studies*

1) Self-efficacy among Patients with CVDs

Self-efficacy is considered a significant element for patients with CVDs. Earlier studies assessed the level of self-efficacy among patients with CVDs. A Palestinian study revealed that the mean scores of self-efficacy scales (PEPPI and SES6C) were 20.0 (SD=4.4) and 41.1 (SD= 10.6), respectively (Khairy et al., 2021). Another Palestinian study conducted by Barham et al. (2019) adopted a cross-sectional design to assess cardiac self-efficacy (CSE) patterns and quality of life (QoL) among patients with coronary heart disease (CHD) and identification of factors affecting QoL. The data were collected from 275 using the following scales: PEPPI-5, SEMCD-6, and SCSES items to evaluate cardiac self-efficacy, and EuroQoL 5-dimensions questionnaire (EQ-5D-5 L), and Euroqol Visual Analogue Scale (EQ-VAS) to assess health-related QoL (HRQoL). Findings demonstrated that the median scores of the PEPPI-5, SCSES, and SEMCD-6 were 17.00 (interquartile range [IQR]: 15.00–20.00), 34.00 [IQR: 29.00–38.00], and 5.80 [IQR: 5.00– 6.80], respectively. Also, the median of the EQ-5D was 0.64 [IQR: 0.56–0.73]. QoL had moderate positive relationships with the PEPPI-5 *($r = 0.419, p < 0.001$)*, SEMCD-6 *($r = 0.419, p < 0.001$)*, and SCSES *($r = 0.273, p < 0.001$).* Also, the lower levels of self-efficacy and worse patient-physician experiences were the predictors of bad HRQoL.

Kärner Köhler et al. (2018) used a cross-sectional study to measure papatients'eneral self-efficacy and identify the correlation between general self-efficacy and other factors, including QoL and demographics in Swedish hospitals. Hundred and seventy-five cardiac patients six to twelve months after a cardiac patient participated in this study. The Swedish-CES-10, EQ5D, and Ladder of Life questionnaires were used to obtain data. Results showed the mean level of patient general self-efficacy was 3.13 (0.52), respectively. The patient's general self-efficacy was strongly associated with marital status. General self-efficacy was not correlated with any of the variables individually. In addition, patients with CHD showed a high level of general self-efficacy. Clinical and demographic factors were not separately related to low general self-efficacy.

2) Self-care Behaviors among Patients with CVDs

Some studies discussed that SCBs are behaviors among patients with CVDs. Twalbeh et al. (2018) performed an analysis to assess the SCBs in patients who experienced HF. A cross-sectional design was adopted, and a convenience sample consisting of 226 Jordanian patients was obtained. Results revealed that the mean of SCBs was 53.89, which is considered under the clinical level (≥70). Inquiring low salt food and practicing physical exercises were the most achieved behaviors, while "attempting to avoid becoming sick" and "checking ankles for swelling" were the least reached SCBs. Furthermore, Asadi et al. (2019) conducted a path analysis study to investigate the SCBs among 77 Iranian patients who experienced H.F. Findings explained the mean of SCBs was 39.42 (SD= 7.04), and 67.5% of the patients had a moderate level.

Peyman and colleagues (2018) found that the mean of SCBs among Iranian patients with HF was 31.11 (SD=8. 21), which was low. Also, Tawalbeh et al. (2017) adopted a cross-sectional, descriptive study to assess the levels of SCBs among patients with HF. A convenience sample of 226 Jordanian patients was recruited, and the Dutch Heart Failure Scale and the Self-Care of Heart Failure Index (SCHFI) version 6.2 were used for data collection. The overall HF awareness score was low at 5.29. The SCHFI self-care management subscale mean was 57.56, with an actual range of 10–90, and the SCHFI self-care maintenance subscale mean 53.89, with an existing range of 13.33–86.66. The SCHFI self-care confidence subscale mean was the lowest of the three at 45.07, with an actual capacity of 5.56–94.52. The mean scores for all three subscales were lower than the clinical goal level (≥70) for the SCHF. Additionally, Lee and Park (2017) found that Korean elderly patients with uncontrolled hypertension had lower levels of SCBs in comparison with the controlled group.

Zinat Motlagh et al. (2016) used a cross-sectional design to assess the SCBs among patients with hypertension in Iran. A random sampling method was adopted to engage 1836 patients. The hypertension self-care activity level effects were used to determine SCBs. Results showed that 36.1% of the patients endorsed medication adherence, 24.5% reported physical activity adherence, 12.3% had low salt food adherence, and 39.2% performed the requirements of activities for weight management. Additionally, all were not alcohol drunk, and 86.7% were not smoking.

3) Factors Associating Self-efficacy

Many studies doc that cemented the relationship between self-efficacy and demographic data, and psychosocial factors. Khairy et al. (2021) evaluated self-efficacy and factors correlated with self-efficacy among Palestinian patients with hypertension. A cross-sectional design was selected, and a sample of 377 patients was recruited. Data were collected

using SES6C and PEPPI, in addition to demographic data from three health centers. Results demonstrated that being urban *(B=3.597, p< 0.01)* and higher education *(B=4.010, p< 0.01)* were the main predictors of PEPPI, while average body mass index (BMI) was the main predictor of SES6C *(B=5.566, p < 0.001)*.

Mazar and colleagues (2020) evaluated the self-efficacy of Iranian patients with hypertension. A correlational design and a random sample of 385 patients who attended health centers were adopted to perform the study. A self-efficacy scale and demographic questionnaire were utilized to collect data. Results demonstrated that the mean score of self-efficacy was 64.3 (SD= 15.1). The higher self-efficacy scores were correlated with regular medication use, and the lower scores were linked with regular physical activity and management and control of stress. Also, there was a significant correlation between self-efficacy and age, stress, illness duration, systolic and diastolic blood pressure, and social support.

Wantiyah et al. (2020) adopted an observational and a cross-sectional design to examine the correlation between self-efficacy and health status among patients with CAD. This study recruited 112 Indonesian patients using a convenience sampling method. The data were collected using Cardiac Self-Efficacy (CSE) and the Seattle Angina Questionnaire (SAQ). Findings showed that the participants had good self-efficacy and health status *(71.41 and 79.56, respectively)*. Also, health status was significantly associated with self-efficacy *(r = 0.307, p < 0.01)*.

4) Factors Associating Self-Care Behaviors

Many previous studies discussed factors associated se SCBs. In a cross-sectional study performed by Kim et al. (2020) to determine the impacts of self-efficacy, anger trait, depression, and anger expression on health care behaviors in 208 Korean older women who suffered from hypertension on 208 women. Results showed that exercise had the main significant impact on these behaviors *(β = 0.36, p < 0.001)*, then, depression *(β = −0.31, p < 0.001)*, followed by anger trait *(β = 0.21, p <0.01)*, anger control *(β = 0.20, p < 0.001)*, religion *(β = 0.18, p < 0.01)*, and self-efficacy *(β = 0.18, p < 0.01)*. Anger traits, and anger control, were the main predictors of health care behaviors.

Peyman et al. (2020) evaluated the impact of education strategies of self-efficacy on SCBs among patients with H.F three times (before, post, and three months follow-up). A quasi-experimental design was adopted, and 80 Iranian participants were divided into two groups (intervention and control). The experimental group was given three training sessions (minutes), while the control group provided routine care services. Findings showed the mean for the SCBs and self-efficacy pre-intervention in the intervention group was 23.50 (SD=6.58) and 18.57(SD = 6.64), respectively, and increased to 42.64 (SD=6.74 *(p < 0.05)* and 32.29 (SD=7.06) *(p < 0.001)*, respectively, post-intervention. A significant increase happened after three months *(p < 0.001)*. A positive relationship was found between SCBs and self-efficacy shortly post-intervention *(r = 0.82, p < 0.001)* and three months later *(r = 0.85, p < 0.001)*.

Summary

According to the literature review, numerous studies have been performed worldwide on self-efficacy and SCBs among CVDs, particularly hypertension and HF. On the contrary, few types of research were studied self-efficacy and SCBs in patients with CAD. Also, few studies were conducted in the Arab countries about self-efficacy and SCBs among patients with CVDs. Additionally, there are no published studies on the effect of self-efficacy on SCBs among CAD in the Arab world, specifically Jordan. In Jordan, few studies were performed about SCBs in patients with CVDs, especially HF. On the other hand, there was a lack of studies on self-efficacy and SCBs among patients with CADs.

The majority of the previous studies adopted a cross-sectional and descriptive correlational design, but there was a lack of qualitative and longitudinal studies. However, many studies examined demographic variables; this study significantly focused on the selected demographic factors (e.g., age, gender, educational level, marital status, income/month, and disease duration) to correlate with self-efficacy and SCBs.

The previous studies concluded that patients with CVDs had lower and moderate levels of self-efficacy, and most of the studies concluded that patients with CVDs had lower level SCBs. Also, these studies showed that higher SCBs were associated with daily medication use, while lower scores were associated with regular physical activity and stress management and control. In addition, health status was significantly associated with self-efficacy. There was a significant association between self-efficacy and hypertension, age, stress, illness duration, systolic and diastolic blood pressure, social support, educational level, anxiety, depression and everyday activities, income, gender, and work.

Previous research found that exercise and self-efficacy had the most significant influence on these SCBs. However, shared knowledge, low monthly income, low level of education, short duration of illness, fewer people living at home, being older, and being unemployed were identified as the critical determinants of low SCBs.

II. Research Design

For the current study, a cross-sectional, descriptive correlational design was used. This design gathers data over a short period and at one point. It also describes and discusses the variables and their associations (Polit & Beck, 2017). It is a cost-effect analysis sign, helping analyze the data to conclude, providing completeness with main data points, and assessing multiple exposures and outcomes (Polit & Beck, 2017). On the contrary, there are many disadvantages of a cross-sectional design, including, it is only effective if it represents the entire population, needs a larger sample size to ensure accuracy, allows bias to affect outcomes, and does not give any power and control over option or purpose (Polit & Beck, 2017).

Also, the descriptive correlational design is used to build a snapshot of a current state of affairs. It provides a complete picture of what happens at a given time and allows questions

for further study to be developed. Also, it is used to determine the relationship between two or more variables and allow testing of the predicted relationship between variables and making predictions. On the other hand, it has disadvantages. It does not determine the relationship between the variables and cannot be utilized to draw inferences about the causal relationship between study variables (Gaille, 2020; Polit & Beck, 2017; Stangor, 2011).

Population and Study Sample

The study population was all patients with CAD attending the cardiac outpatient clinics in the selected hospitals in three government hospitals (AL-Basheer, Princess Basma, and Dr. Jameel Toutanji) and one educational hospital (King Abdullah University Hospital) in Jordan. These hospitals were selected to obtain patients from all different regions in Jordan. Also, these hospitals had outpatient cardiac clinics. Further, the hospitals in the south were not chosen due to the unavailability of cardiac outpatient clinics.

A convenience sampling method was used to recruit the study participants. The sample size was calculated using the G*power program with an alpha of 0.05, a small effect size of 0.06, and a power of 0.95 with ten predictors. According to regression, a total of 416 participants was needed to conduct this study; the piece was increased to 520 to overcome incomplete questionnaires and drop out.

The inclusion criteria included adult patients who were: a) 20 years to less than 60 years, 2) experiencing CAD, 3) having the ability to read and write, 4) not suffering from severe mental or cognitive disorders, and 5) willing to participate in the study. The exclusion criteria involved patients who were admitted to hospitals wards.

Study Settings

This study was conducted at Jordanian hospitals in two sectors: the government and educational hospitals in three different cities in Jordan: Amman, Irbid, and Al-Ramtha.

Concerning the government hospitals, which are part of the Jordanian Ministry of, Health, three hospitals were selected: Al-Basheer, Princess Basma, and Dr. Jameel Toutanji.

Regarding AL-Basheer Hospital, it is located in Amman and was established in 1954 as one of the largest hospitals in Jordan. The hospital consists of 49 buildings and 80 units with 1100 beds, which can be expanded to 1500 beds, with 850 physicians, and 1200 registered and associate nurses (Ministry of Health, 2020). Further, two outpatients' cardiac provide more than 1500 patients per month (Ministry of Health, 2020).

Princess Basma Hospital is another government hospital located in Irbid city. It was established d in 1953 and is considered a central hospital. It receives cases from all peripheral hospitals in Irbid and transfers cases to King Abdullah University Hospital, Jordan University Hospital, and Al-Hussein Medical City. It also serves the population of Irbid Governorate in all its provinces; whose population is more than a million. It consists of 23 units with 337 beds and 338 doctors, including 93 specialists and 245 resident doctors, and 291 nurses, including 17 registered and 17 associate nurses, and 22 practical nurses working in outpatient clinics (Ministry of Health, 2020). In addition, two outpatients' cardiac clinics present treatment for more than 250 patients each month (Ministry of Health, 2020).

Furthermore, Dr. Jameel Toutanji Hospital is located in Amman city, Sahab, founded in 2001. It also serves one million people and consists of one building with five floors and 151 beds. The hospital has 688 employees including, 241 physicians, 148 specialists, 93 resident doctors, and 227 nurses, including 186 registered nurses, 36 associate nurses, and five practical nurses (Ministry of Health, 2020). Further, one outpatient cardiac provides more than 50 patients per month (Ministry of Health, 2020).

Concerning the educational hospitals, the King Abdullah University Hospital is located in Al-Ramtha city and was established in 2002. It is one of the largest hospitals in the north and serves more than one million citizens in Irbid, Ajloun, Jerash, and Mafraq. The hospital consists of 12 floors, 552 beds, with 853 physicians including 221 specialists, 457 resident doctors, 175 intern doctors, and 834 nurses, including 756 registered nurses, 50 associate nurses, and 28 practical nurses. In addition, two outpatients' cardiac clinics offer treatment for more than 1400 patients per month (King Abdullah University Hospital, 2020).

Study Measurements

A structured self-reporting questionnaire was used in this study. The questionnaire involves the following measurements: demographic information, cardiac self-efficacy scales, self-care behaviors, and psychosocial factors (e.g., depression, anxiety, stress, and social support).

- *Demographic data* (Appendix A) includes:
  - ✓ *Age:* Participants' age in years.
  - ✓ *Gender:* It was classified into male and female.
  - ✓ *Educational level*: It was the completed level of education and has been graded as a primary, preparatory, secondary, diploma, and bachelor's degree and higher.
  - ✓ *Marital status:* It was classified into single, married, divorced, widow.
  - ✓ *Income/month*: The patients earned income in one month in Jordanian dinar (JOD).
  - ✓ *Duration of disease:* It was the average time people had the disease in years.
- *Cardiac Self-Efficacy (CSE) Scales* (Appendix A)**:** Three scales were used to assess self-efficacy among patients with CAD including, 1) the 5-items perceived efficacy in patient-physician interaction scale (PEPPI-5), 2) The self-efficacy for management of chronic disease 6-item scale (SEMCD-6), and 3) Sullivan's cardiac self-efficacy scale (SCSES). The PEPPI-5 was developed by Henselmans et al. (2015) and consisted of five items related to patient-physicist interactions; these items are scored from one (not at all confident) to five (very secure). The scale score ranges from 5 to 25, whereas the higher scores suggest higher self-efficacy. The scoring system was according to the cut-off median, which was 15, in which the scores less than 15 indicate low self-efficacy and equal or more increased 15 indicate high self-efficacy (Barham et al.,

2019). This scale had high internal consistency, in which Cronbach's α coefficient was 0.90 (Henselmans et al., 2015). The SEMCD-6 was evolved by Lorig et al. (2001) and consisted of six items scored on a 10-points scale ranging from 1 = "not at all confident" to 10 = "totally confident." Total scores of this scale range from 6 to 60, whereas higher scores, indicate higher perception of self-efficacy. The scoring system was according to the cut-off median, which was 33, in which the scores less than 33 indicate low self-efficacy and equal or higher 33 indicate high self-efficacy (Barham et al., 2019). This scale had high internal consistency reliability, in which the Cronbach's alpha was 0.91(Lorig et al., 2001). In addition, the SCSES that was evolved by Sullivan et al. (1998) is composed of 13 items. The scale items are graded from 0 (not confident) to 4 (entirely sure). This scale has two dimensions: control symptoms (eight questions) and maintenance functioning (five questions). The scoring system was according to the cut-off median, which was 26, in which the scores less than 26 indicate low self-efficacy and equal or higher 26 indicate high self-efficacy (Barham et al., 2019). It has solid internal consistency, with Cronbach's alpha (0.90 and 0.87, respectively). The Arabic versions of these scales were used, valid, and reliable, whereas the internal consistency with Cronbach's alpha for the PEPPI-5, SEMCD-6, and SCSES were 0.799, 0.865, and 0.848, respectively (Barham et al., 2019) (Appendix B).

- *Self-care of Coronary Heart Disease Inventory (SC-CHDI) Version 3*: It was used to evaluate SCBs among patients with CAD. It was developed by Vaughan et al. (2017) and was composed of 23 items divided into three sub-scales including, self-care maintenance (9 items), management (8 items), and confidence (6 items). The self-care maintenance subscale items scored on a four-point Likert scale ranging from 1 (never) to 4 (always). In contrast, the subscale self-care management items scored on the scale ranging from zero (never) to 4 (very sure/always), and the self-confidence subscale items rated on four-point Likert scale ranging from 1 (not sure) to 4 (very specific). The questionnaire score is between 16 and 88, whereas the higher score indicates the higher SCBs. The mean determined the scores for the instruments for the full scale, in which the mean scores were more minor than the mean suggesting low self-care and ≥ mean reflect high self-care. This scale is valid and reliable, in which Cronbach's alpha was 0.91 (Vaughan et al., 2017) (Appendix A).

  Because the SC-CHDI was in English and the official language in Jordan is Arabic, this scale was translated into Arabic and back-translation into English by independent bilingual translators to assess its translational validity and ensure its accuracy (Appendix B). The Arabic version was edited by an Arabic translator with a Ph.D. in Arabic. Further, the content validity index (CVI) was assessed by asking three experts in the study field. These experts were provided with a brief overview of the study purposes and the tool attached with the content validity index form for scoring the items in the device. This tool and CVI form were sent to the jury via e-mail (Appendix C).

  The Content Validity Index (CVI) included a rating scale of four choices for each item in the questionnaire: 1=non-relevant; 2=somewhat relevant; 3=relevant but requiring a minor change; 4=relevant. After the content validation process, the experts gave four things, where the total CVI for the tool was equal to 1.

  Further, the reliability of SC-CHDI was calculated using internal consistency reliability with Cronbach's alpha. This questionnaire was tested on patients with CAD (N=15) and study data for preferable results. The results found that Cronbach's alpha was 0.83 and 0.824 for the total sample for a pilot study.

- *Psychosocial Factors:* These factors denote the mental and the social elements in a person's life, for instance, depression, anxiety, stress, and social support (Pugh, 2002).
  - ✓ *Depression, Anxiety, and Stress Scale (DASS):* It was initially developed by Lovibond and Lovibond (1995) to evaluate the psychological problems involving anxiety, depression, and stress. It is composed of three subscales: depression, anxiety, and stress, in which each subscale consists of 14 statements that scored using the 4-point Likert scale ranging from 0 (not applicable) to 3 (very much, or most of the time, or a good part of the time). The scores of each subscale were counted by summing up the scores for the relevant products. The depression, anxiety, and stress levels were determined by summing up the related items' scores to provide three scores for the three subscales. Possible scores for each subscale ranged from zero to 42, where the depression score was as follows: scores from 0 to 9 display no signs of depression, scores from 10 to 13 represent mild depression, scores from 14 to 20 represent moderate depression, scores from 21 to 27 suggest severe depression, and scores from 28 and above reflect incredibly severe depression. However, the subscale of anxiety rated as follows: scores from 0 to 7 reflect no concern, scores from 8 to 9 indicate mild anxiety, scores from 10 to 14 indicate moderate anxiety, scores from 15 to 19 reflect severe anxiety, and scores from 20 and more indicate extremely severe anxiety. In addition, the stress subscale scores are as follows: 0 to 14 indicate no stress, scores from 15 to 18 represent mild stress, scores from 19 to 25 indicate moderate stress, scores from 26 to 33 reflect severe stress, and scores from 34 and more indicate incredibly extreme stress. This tool had strong validity and reliability, with Cronbach's alpha for the depression, anxiety, and stress subscales being 0.94, 0.87, and 0.91, respectively (Antony et al., 1998) (Appendix A). The Arabic version of DASS was adopted to perform this study (Taouk et al., 2001) (Appendix B). This version has strong psychometric properties, with Cronbach's alpha of the Arabic- DASS being 0.95 (Eshah & Rayyan, 2015).
  - ✓ *Multidimensional Social Support Scale (MSPSS):* Zimet et al. (1988) established this scale to assess the

awareness of social support. It is composed of 12 statements that consider social support sources, including family, friends, and significant others (Appendix A). The system of scores for this measure ranges from 1 to 7, while the mean measure score from 1 to 2.9 reflects a low level of social support, 3 to 5 reflects moderate social support, and 5.1 to 7 suggests high social support. This study is valid and reliable, in which internal reliability with Cronbach's alpha equals 0.88 (Zimet et al., 1988). The Arabic version was used and had robust internal consistency reliability, in which the Cronbach's alpha = 0.88 (Alzayyat et al., 2015) (Appendix B).

Ethical Considerations

The approval to perform this study was gained from Institutional Review Board (IRB) at the Al-Zaytoonah University of Jordan, the Jordanian Ministry of Health, and the King Abdullah Educational Hospital (Appendix D). Also, the researcher obtained written informed consent from eligible participants (Appendix E) who were assured of confidentiality. It was also made clear that participation was voluntary. The patients could withdraw at any time of the study, and there would be no direct benefit or reward due to their involvement.

Regarding the instruments, the permission to use the CSE, SC-CHDI, DAAS, and MSPSS was allowed for scientific purposes. Furthermore, permission to use the Arabic version of CSE scales was obtained from the tools' developers in this study.

Method of Data Collection

After acquiring the approval from the selected hospitals, the researcher discussed the study purposes with head nurses of the cardiac clinics to facilitate the study's implementation. The researcher took the responsibility of distributing the questionnaires to the eligible patients. The questionnaires were distributed to the patients attending cardiac outpatients' clinics in the selected hospital and collected simultaneously from the beginning of January to the beginning of March 2021. To ensure a high response rate, the researcher visited the selected clinics several times on different days.

Data Analysis

The "SPSS" statistical package system 23.0 was used to enter and analyze the collected data. Descriptive statistics, including meaning standard deviation, frequencies, percentages, and range, were applied to describe study variables. Pearson's and point-biserial correlation tests were utilized to examine the relationships between demographic and psychosocial factors with self-efficacy and SCBs. The multivariable linear regression was used to explore the main predictors of self-efficacy and SCBs, in addition to the effect of self-efficacy on SCBs. The level of significance was determined at ≤ 0.05.

Summary

A cross-sectional, descriptive correlational design was used to perform this study. The population of this study included all outpatient clinics in Jordanian hospitals in both government and educational sectors in three different cities in Jordan: Amman, Irbid, and Al-Ramtha. Five hundred and twenty subjects were recruited in this study.

A questionnaire consisting of demographic data, CSE scales, SC-CHDI, and psychosocial factors such as DASS and MSPSS were used to collect data. In addition, to calculate the time required to complete the questionnaire. The researcher distributed the questionnaires to patients in the chosen hospitals to eligible patients with CAD in outpatient clinics.

The SPSS program version 23.0 was utilized for data entry and analysis. The study variables were described using descriptive statistics. Pearson and point-biserial correlation tests were adopted to examine the relationship between self-efficacy and demographic and psychosocial factors. The multivariable linear regression was implemented to assess the main predictors of self-efficacy and the effect of self-efficacy on SCBs.

III. Results

Demographic Characteristics of the Participants

A total of 520 outpatients' cardiovascular clinics were invited to engage in this study. However, 510 of them returned the questionnaire with a response rate of 98.0%, in which ten questionnaires were not returned from the participants. In addition, ten questionnaires were uncompleted. Thus, the final number of completed questionnaires were entered for analysis was 500.

Concerning demographic characteristics, the participants' mean age was M =49.37 (SD = 7.97) with a range of 21-59 years. 66.2% (n=331) of the sample were males, and 33.8% (n=169) were females. The marital status for the participants was distributed as follows: single (n=25, 5%), married (n=454, 90.8 %), divorce (n=3, 0.6%), and widow (n=18, 3.6%). The educational levels of the participants varied from secondary and less (n=263, 52.6 %) to higher than secondary (n=307, 47.4%). The participant's income means per month was 533.56 JOD (SD = 290.43) with a range of 200 to 1800 JOD. The mean duration of participants' disease was 4.14 years (SD = 4.72) with a range of 1 to 26 years, as shown in Table 1.

TABLE 1. Characteristics of the study sample (N= 500)

Characteristic	n	%	
Gender			
Male	331	66.2	
Female	169	33.8	
Educational level			
Secondary and less	263	52.6	
Higher than secondary	237	47.4	
Marital status			
Single	25	5.0	
Married	454	90.8	
Divorce	3	0.6	
Widow	18	3.6	
	M	**SD**	**Range**
Age	49.37 years	7.97	21-59 years
Income/ Month (JOD)	533.56	290.43	200-1800
Duration of the disease	4.14 years	4.72	1-26 years

n: number; %: percentage: M: Mean: SD: Standard Deviation

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Research Question One:
What are the levels of self-efficacy and SCBs in patients with CAD in Jordan?

Table 2 explains the levels of self-efficacy and SCBs among patients with CAD in Jordan. For cardiac self-efficacy (CSE) scales, the scoring system was according to the cut-off median, in which the medians of the PEPPI-5, SEMCD-6, and SCSES were 20.00 (IQR: 20.00-25.00), 39.00 (IQR: 30-48.00), and 39.00 (IQR: 26-39), respectively. These results reflect higher self-efficacy levels, including patient-physician interaction, self-efficacy for management of chronic disease, and Sullivan's cardiac self-efficacy. The participants' mean of the SCBs was M=2.95 (SD=0.47) with a range of 1.37-3.87, indicating high SCBs.

TABLE 2. Levels of self-efficacy and self-care behaviors among patients with CAD in Jordan

	Median	Interquartile range (25-75)		Cutoff - median
Self-efficacy Patient-physician interaction	20	20-25		15
Self-efficacy for management of chronic disease	39	30-48		33
Sullivan's cardiac self-efficacy	39	26-39		26
	Mean	**SD**	**Range**	
Self-care behaviors	2.95	0.47	1.36-3.87	

SD: Standard deviation

Research Question Two:
The relationship between selected demographic variables (age, gender, educational level, marital status, income/month, and duration of disease), psychosocial factors (depression, anxiety, stress, and social support), and self-efficacy in patients with CAD in Jordan?

Table 3 illustrates the statistical results of correlation (r and point-biserial) that assess the relationship between selected demographic factors, psychosocial factors, and self-efficacy among patients with CAD. The results about patient-physician interaction demonstrated a positive correlation with social support *($r_{(498)} = 0.240$, $p < 0.001$)*, on the other hand, there was a negative correlation with educational level *($p.b.r_{(498)} = -0.130$, $p < 0.01$)*. For self-efficacy for management of chronic disease, there was a negative correlation with depression *($r_{(498)} = -0.169$, $p < 0.001$)*, anxiety *($r_{(498)} = -0.136$, $p < 0.05$)*, and stress *($r_{(498)} = -0.129$, $p < 0.01$)*. On the other hand, there was a positive relationship between self-efficacy for management of chronic disease and social support *($r_{(498)} = 0.224$, $p < 0.001$)*.

Regarding Sullivan's cardiac self-efficacy, the findings found a negative correlation with depression *($r_{(498)} = -0.096$, $p < 0.05$)*, *anxiety ($r_{(498)} = -0.110$, $p < 0.05$)*, stress *($r_{(498)} = -0.091$, $p < 0.05$)*, and marital status *($p.b.r_{(498)} = -0.097$, $p < 0.05$)*. Also, there was a positive correlation between Sullivan's cardiac self-efficacy, social support *($r_{(498)} = 0.267$, $p < 0.001$)*, and educational level *($p.b.r_{(498)} = 0.091$, $p < 0.05$)*.

TABLE 3. Relationship between selected demographic factors, psychosocial factors, and self-efficacy

Variables	Self-efficacy					
	Patient-physician interaction		Self-efficacy for management of chronic disease		Sullivan's cardiac self-efficacy	
	r	p-value	r	p-value	r	p-value
Age	0.005	0.919	0.077	0.860	0.64	0.153
Income/month	-0.084	0.059	-0.031	0.493	0.058	0.199
Duration of disease	0.044	0.326	0.066	0.139	0.061	0.171
Stress	-0.037	0.406	-0.129	0.004**	-0.091	0.042*
Anxiety	-0.040	0.374	-0.136	0.002**	-0.110	0.014*
Depression	-0.002	0.969	-0.169	< 0.001**	-0.096	0.032*
Social support	0.240	< 0.001***	0.224	< 0.001**	0.267	< 0.001***
	p.b.r	**p-value**	**p.b.r**	**p-value**	**p.b.r**	**p-value**
Gender	-0.002	0.961	-0.063	0.160	-0.079	0.77
Educational level	-0.130	0.004**	0.044	0.330	0.091	0.042*
Marital status	0.055	0.221	-0.085	0.059	-0.097	0.031*

p.b. r: point-biserial correlation, *. Correlation is significant at the ≤ 0.05 level (2-tailed), **. Correlation is significant at the ≤ 0.01 level (2-tailed), ***. Correlation is significant at the ≤ 0.001 level (2-tailed).

Research Question Three:
What is the relationship between selected demographic variables (age, gender, educational level, marital status, income/month, and duration of disease), psychosocial factors (depression, anxiety, stress, and social support), and self-care behaviors in patients with CAD in Jordan?

The correlations between selected demographic factors, psychosocial factors, and SCBs among patients with CAD were explained in Table 4. The results demonstrated a significant a positive relationship between SCBs behaviors and age *($r_{(498)} = 0.178$, $p < 0.001$)*, duration of disease *($r_{(498)} = 0.108$, $p < 0.05$)*, and marital status *($p.b.r_{(498)} = 0.094$, $p < 0.05$)*. Otherwise, there was a negative relationship between SCBs and anxiety *($r_{(498)} = -0.111$, $p < 0.05$)*.

TABLE 4. Relationship between selected demographic factors, psychosocial factors, and self-care behaviors

Variables	re behaviors	
	r	p-value
Age	0.178	< 0.001**
Income/month	-0.013	0.771
Duration of disease	0.108	0.016*
Stress	-0.086	0.056
Anxiety	-0.111	0.013*
Depression	-0.052	0.250
Social support	0.246	< 0.001**
	p.b.r	**p-value**
Gender	-0.013	0.771
Educational level	0.068	0.128
Marital status	0.094	0.036*

p.b. r: point-biserial correlation

**. Correlation is significant at the ≤ 0.05 level (2-tailed)*
***. Correlation is significant at the ≤ 0.01 level (2-tailed).*
****. Correlation is significant at the ≤ 0.001 level (2-tailed).*

Research Question Four:
What are the predictors of self-efficacy in patients with CAD in Jordan?

The assumptions of regression were applied by assessing multicollinearity using tolerance and variance inflation factor (VIF). Warner (2008) suggested that if the tolerance value is less than 0.01 and VIF values are greater than 10, there is a collinearity problem. In the current study, the VIF and tolerance values were within an acceptable range for patient-physician interaction, self-efficacy for management of chronic disease and Sullivan's cardiac self-efficacy. Furthermore, the autocorrelation assumption was tested using the Durbin-Watson test; the findings for patient-physician interaction, self-efficacy for management of chronic disease, and Sullivan's cardiac self-efficacy were as follows: 1.975, 2.144, and 2.094, respectively, which reflect a positive and acceptable autocorrelation.

The main predictors of patient-physician interaction were tested using multivariable linear regression analysis. As explained in Table 5, the variables that entered the model as predictors of patient-physician interaction were social support and educational level. The full model that included all predictors of patient-physician interaction was statistically significant *($F_{(2, 497)} = 15.486$, $p < 0.001$, $R = 0.242$, $R^2 = 0.059$, adjusted $R^2 = 0.055$)*. This stated that the model as a whole illustrated 5.9% of the variance in patient-physician interaction. The findings showed that social support (*$B = 0.237$, $p < 0.001$)* and educational level (*$B = -0.130$, $p < 0.001$)* were the significant predictors of patient-physician interaction among patients with CAD in outpatient's cardiovascular clinics. Moreover, the beta coefficient for social support was 0.237, representing that a one-point increase in social support was correlated with a 0.237 increase in patient-physician interaction. Additionally, the beta coefficient for the educational level was -0.130, representing that a one-point increase in social support was correlated with 0.130 decreases in patient-physician interaction.

TABLE 5. Multivariable linear regression for predictors of patient-physician interaction

Predictor	b	B	t-test	p-value	95.0% CI		Correlations	
					Lower	Upper	Part	Part^2
Social support	0.229	0.237	5.421	< 0.001	0.146	0.312	0.236	0.055
Educational level	-0.093	-0.130	-2.924	0.004	-0.155	-0.030	-0.130	0.0169

b: Unstandardized beta; B: Standardized beta; CI: Confidence Interval

TABLE 6. Multivariable linear regression analysis for predictors of self-efficacy for management of chronic disease

Predictor	b	B	t-test	p-value	95.0% CI		Correlations	
					Lower	Upper	Part	Part^2
Social support	0.474	0.213	4.884	< 0.001	0.284	0.665	0.211	0.044
Depression	-0.037	-0.163	-2.40	0.024	-0.068	-0.005	-0.098	0.01
Stress	-0.001	-0.003	-0.036	0.971	-0.031	0.030	-0.002	0.000004
Anxiety	0.003	0.015	0.162	0.871	-0.036	0.042	0.007	0.000049

b: Unstandardized beta; B: Standardized beta; CI: Confidence Interval

As explained in Table 6, the variables that entered the model as predictors of self-efficacy for chronic disease management were depression, anxiety, stress, social support, and marital status. The full model that included all predictors of self-efficacy for management of chronic disease was statistically significant *($F_{(4, 495)} = 9.811$, $p < 0.001$, $R = 0.271$, $R^2 = 0.073$, adjusted $R^2 = 0.066$)*. This stated that 7.3% of the variance in self-efficacy for managing chronic disease was illustrated by the model as a whole. The findings showed that social *support ($B = 0.213$, $p < 0.001$)* and depression *($B = -0.163$, $p < 0.05$)* were the significant predictors of self-efficacy for management of chronic disease among patients with CAD in outpatient clinics. Moreover, the beta coefficient for social support was 0.213, representing that a one-point increase in social support was correlated with a 0.213 increase in self-efficacy for management of the chronic disease. Moreover, the beta coefficient for depression was -0.163, representing that a one-point decrease in depression was correlated with a 0.163 increase in self-efficacy for managing the chronic disease. Social support was the significant predictor of self-efficacy for management of chronic disease, in which part= 0.211 and part ^{2} = 0.044.

As explained in Table 7, the model's variables as predictors of Sullivan's cardiac self-efficacy were social support, educational level, marital status, depression, anxiety, and stress. The full model that included all predictors of Sullivan's cardiac self-efficacy was statistically significant *($F_{(6.493)} = 9.486$, $p < 0.001$, $R = 0.322$, $R^2 = 0.103$, adjusted $R^2 = 0.093$)*. This stated that the whole model illustrated 10.3% of the variance in Sullivan's cardiac self-efficacy. The findings showed that social support *($B = 0.285$, $p < 0.001$)*, educational level *($B = 0.093$, $p < 0.05$)*, and marital status *($B = -0.112$, $p < 0.05$)* were the significant predictor of Sullivan's cardiac self-efficacy among patients with CAD in outpatient's clinics. Moreover, the beta coefficient for social support was 0.285, illustrating that a one-point increase in social support is correlated with a 0.285 increase in Sullivan's cardiac self-efficacy. Additionally, the beta coefficient for educational level was 0.093, explaining that a one-point increase in the educational level was correlated with a 0.093 increase in Sullivan's cardiac self-efficacy. Also, the beta coefficient for marital status was -0.112, representing that a one-point decrease in the marital status is correlated with a 0.112 increase in Sullivan's cardiac self-efficacy. The strongest predictor of Sullivan's cardiac self-efficacy was social

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support, in which part and part ^{2} equal 0.279 and 0.078, respectively.

TABLE 7. Multivariable linear regression for predictors of Sullivan's cardiac self-efficacy

Predictor	b	B	t-test	p-value	95.0% CI		Correlations	
					Lower	Upper	Part	Part^2
Social support	0.250	0.285	6.548	< 0.001	0.175	0.325	0.279	0.078
Educational level	0.060	0.093	2.106	0.036	0.004	0.117	0.090	0.008
Marital status	-0.208	-0.112	-2.552	0.011	-0.367	-0.048	-0.109	0.012
Stress	0.003	0.044	0.569	0.570	-0.008	0.015	0.024	0.00058
Depression	0.001	0.009	0.127	0.899	-0.012	0.013	0.005	0.00002
Anxiety	-0.010	-0.119	-1.280	0.201	-0.025	0.005	-0.055	0.00302

b: Unstandardized beta; B: Standardized beta; CI: Confidence Interval

TABLE 8. Multivariable linear regression for predictors of self-care behaviors

Predictor	b	B	t-test	p-value	95.0% CI		Correlations	
					Lower	Upper	Part	Part^2
Social support	0.108	0.215	4.928	< 0.001	0.065	0.151	0.211	0.044
Age	0.006	0.107	2.286	0.023	0.001	0.012	0.098	0.01
Duration of disease	0.007	0.069	1.559	0.120	-0.002	0.016	0.067	0.00448
Anxiety	0.004	-0.075	-1.721	0.086	-0.008	0.001	-0.074	0.00548
Marital status	0.036	0.034	0.757	0.449	-0.057	0.129	0.032	0.00102

b: Unstandardized beta; B: Standardized beta; CI: Confidence Interval

Research Question Five:

What are the predictors of SCBs in patients with CAD in Jordan?

Multicollinearity assumption adopting tolerance and variance inflation factor (VIF) data were used to test regression assumptions. The VIF and tolerance values in the current study were within the acceptable range for SCBs. Furthermore, the autocorrelation was tested using the Durbin-Watson test, which produced a value for self-care behaviors of 1.862, indicating positive and good autocorrelation.

The main predictors of SCBs were tested using multiple linear regression analysis. As explained in Table 8, the variables were entered as the main predictors of SCBs in the model: social support, age, duration of disease, anxiety, and marital status. The full model that involved all predictors of SCBs was statistically significant *($F_{(5.494)} = 9.866$, $p < 0.001$, $R = 0.301$, $R^2 = 0.091$, adjusted $R^2 = 0.082$)*. This stated that 9.1% of the variance in SCBs was illustrated by the whole model. The findings showed that social support (*$B = 0.215$, $p < 0.001$)* and age *($B = 0.107$, $p < 0.05$)* were the significant predictors of SCBs among patients with CAD in outpatient's clinics. Moreover, the beta coefficient for social support was 0.215, showing that a one-point increase in social support was correlated with a 0.215 increase in SCBs. Moreover, the beta coefficient for age, was 0.107 representing that a one-point increase was correlated with a 0.107 increase in SCBs. Social support was the strongest predictor of SCBs, in which part =0.211 and part ^{2} = 0.044.

Research Question six:

Is there an effect of self-efficacy on SCBs among patients with CAD in Jordan?

A multivariable linear regression analysis was utilized to evaluate the significant effect of self-efficacy on SCBs in patients with CAD in Jordan. As shown in Table 9, there was an effect of patient-physician interaction on SCBs and was statistically significant

($F_{(3.496)} = 60.250$, $p < 0.01$, $R = 0.517$, $R^2 = 0.267$, adjusted $R^2 = 0.263$). This reflected that 26. 7% of the variance in SCBs was explained by the model. Also, *$B = 0.325$, $p < 0.001$*, which means that the beta coefficient for patient-physician interaction effect on SCBs was 0.325 that indicates self-efficacy was associated with 0.325 increases in SCBs.

Also, there was an effect of self-efficacy for management of chronic disease on SCBs and was statistically significant *($F_{(3, 496)} = 60.250$, $p < 0.001$, $R = 0.517$, $R^2 = 0.267$, adjusted $R^2 = 0.263$*, which indicated that 26.67% of the variance in SCBs was explained by the model. Also, *$B = 0.167$, $p < 0.001$*, which means that the beta coefficient for the effect of self-efficacy for management of chronic disease on SCBs was 0.167, indicating that self-efficacy for management of chronic disease was associated with 0.167 increases in SCBs.

Additionally, Sullivan's cardiac self-efficacy had an effect on SCBs *($F_{(3.496)} = 60.250$, $p < 0.001$, $R = 0.517$, $R^2 = 0.267$, adjusted $R^2 = 0.263$)*, which pointed that 26.3% of the variance in SCBs was clarified by the model. Also, *$B = 0.175$, $p < 0.001$*, which means that the beta coefficient the Sullivan's cardiac self-efficacy effect on SCBs was 0.175, indicating Sullivan's cardiac self-efficacy was associated with 0.175 increases in SCBs. Also, the patient-physician interaction had the highest effect on SCBs among patients with CAD, in which part = 0.297 and part ^{2}= 0.088.

TABLE 9. Effect of self-efficacy on self-care behaviors among patients with CAD in: Multivariable Linear Regression

Predictor	b	B	t-test	p-value	95.0% CI		Correlations	
					Lower	Upper	Part	Part^2
Patient-physician interaction	0.168	0.325	7.717	< 0.001	0.125	0.211	0.297	0.088
Self-efficacy for management of chronic disease	0.037	0.167	3.772	< 0.001	0.018	0.057	0.145	0.021
Sullivan's cardiac self-efficacy	0.100	0.175	3.827	< 0.001	0.049	0.151	0.147	0.022

b: Unstandardized beta; B: Standardized beta; CI: Confidence Interval

Summary

In the current study, 520 patients with CAD were invited to participate, where as 500 questionnaires were entered for analysis. Concerning the levels of self-efficacy and SCBs among patients with CAD in Jordan, the results revealed that the majority of the participants had high self-efficacy and SCBs.

There was a significant correlation between self-efficacy, psychological factors, and some demographic variables (educational level and marital status). Also, SCBs were correlated with age, duration of disease, anxiety, social support, and marital status. In addition, there was a significant effect of self-efficacy on SCBs. Social support was the main predictor of self-efficacy and SCBs among parents with CAD.

Discussion of the Results

This study aimed to evaluate the self-efficacy and SCBs among patients suffering from CAD in Jordan.

Concerning self-efficacy, this study found that the median of the three scales of self-efficacy (patient-physician interaction, self-efficacy for management of chronic disease, Sullivan's cardiac self-efficacy) was high. High self-efficacy could reflect that the study participants are adequately dealing with CAD and its management, and they might suppose that they have the capabilities and skills to succeed. Thus, self-efficacy is a significant concept that influences patients' behaviors in treating chronic diseases such as CAD (Barham et al., 2019).

This finding was higher than previous Palestinian research (Barham et al., 2019) and nearly similar to another Palestinian study (Khairy et al., 2021) that used the same scales. Also, this present result was higher than other studies, which reported a moderate level of self-efficacy among Iranian patients with heart diseases (Ejadi et al., 2018) and a low level among Iranian (Peyman et al., 2018) and Korean (Lee & Park, 2017) patients with CVDs. This study result could be potentially related to characteristics of the sample. They were adults with a mean age of forty, and more than one-third of them completed higher than secondary education. Earlier studies explained that high self-efficacy could be related to a variety of factors, involving higher education (Khairy et al., 2021; Peyman et al., 2018), good health status (Wantiyah et al., 2020), strong social support (Chair et al., 2015), adequate knowledge about the disease, and experience with the illness (Kang & Yang, 2013).

Regarding SCBs, the findings of this Jordanian research demonstrated that participants had high SCBs. This study result is higher than those reported in previous international and national studies; for example, in Jordan, the patients with H.F had low SCBs (Twalbeh et al., 2018; Tawalbeh et al., 2017). Also, other Iranian studies (Peyman et al., 2020; Peyman et al., 2018; Shojaei et al., 2011; Zamanzadeh et al., 2012; Zinat Motlagh et al., 2016) and Taiwanese and American studies (Macabasco-O'Connell et al., 2008; Tung et al., 2012) revealed that SCBs was low among patients with CVDs. The clarification of this study finding could be due to the high self-efficacy that motivates the patients to follow the treatment regimen and other self-care activities. Previous literature has shown that self-efficacy significantly impacted SCBs (Bahari et al., 2019; Lee & Park, 2017; Hu et al., 2015). Earlier studies explained that the enhancement in SCBs could be related to health intervention programs provided by the healthcare professionals in the clinics (Peyman et al., 2020; Tawalbeh et al., 2017).

Regarding the correlation between psychosocial variables and self-efficacy, this study demonstrated that stress was negatively associated with SEMCD-6 and SCSES. This reflects that low-stress levels correlated with high self-efficacy. This finding is consistent with earlier studies (Mazar et al., 2020; Susanto et al., 2019) that confirmed the same results. Stress has an effect on risk factors for many diseases that can be regulated, as well as therapeutic management (Roohafza et al., 2016). Further, it can affect the individuals' life and create a type of disease in them. Thus, stress, emotions, and mental pressures shade the individuals' self-efficacy and efficiency in different areas of their lives (Arezou Khaleghi & Najafabadi, 2015; Ratios, 2007).

Findings found that anxiety negatively correlated with SEMCD-6 and SCSES. These results indicate that patients with high anxiety levels had a low level of self-efficacy. Anxious patients were less likely to participate and adhere to cardiac rehabilitation interventions and services (McGrady et al., 2009). Patients with CAD are highly susceptible to poor health-related quality of life and self-efficacy due to anxiety (Le et al., 2018). These study findings are supported by earlier studies (Mazar et al., 2020; Susanto et al., 2019). Anxiety from the consequences of the disease may minimize the quality of patients' productivity results from poor self-efficacy. Also, it makes them dissatisfied in their personal lives and therapeutic management (Lenze & Wetherell, 2011).

The findings found that depression was negatively correlated with SEMCD-6 and SCSES among Jordanian patients with CAD. Patients with high levels of depression may experience low self-efficacy for management of chronic disease and Sullivan's cardiac self-efficacy. Previous literature confirmed this study's results (Kim et al., 2020; Purnomo et al., 2020; Susanto et al., 2019). On the contrary, Sarkar and colleagues (2007) found no correlation between self-efficacy and depression. Also, in the present study, depression was a predictor of self-efficacy for chronic managing disease, which is congruent with earlier evidence (Susanto et al., 2019). The probable explanation of these findings is that the patients with CAD suffer from many stressful experiences and tensions that affect their mental health and make them vulnerable to mental problems such as depression. Depression can affect their efficacy and capabilities in performing complex tasks and lower their aspirations and commitment to treatment (Australian Psychological Society, 2018; Bandura, 2000).

According to the results of this Jordanian study, the three scales of self-efficacy were positively correlated with social support, which indicates that patients with CAD who had high social support had high self-efficacy. Also, social support was the main predictor of self-efficacy. This study result was confirmed by earlier studies (Mazar et al., 2020; Purnomo et al., 2020; Susanto et al., 2019), demonstrating that self-efficacy had a significant correlation with social support. This

finding is anticipated because the Jordanian population is heavily influenced by social, cultural, and religious factors. Patients with chronic diseases such as CAD receive additional social support from their families, creating emotional and financial burdens. Also, encourage them to have external control over their condition. Social support serves as external motivation to behave appropriately, perform activities, and adapt with defensive any life problems (Baqutayan, 2011), particularly in the positive social relationships and emotional/informational support (Chair et al., 2015).

The current research findings demonstrated that educational level was negatively correlated with PEPPI-5, which explains that patients with low academic levels had more patient-physician interaction. This study result could be described as those patients with low educational levels may need more knowledge about their disease. Thus they have more interaction with their physicians. Also, it was the predictor for patient-physician interaction self-efficacy.

On the contrary, the educational level had a positive correlation with SCSES, in which higher academic level accompanied with higher SCSES. This result is consistent with Khairy et al.'s (2021) study. Also, earlier evidence showed that educational level had a positive relationship with self-efficacy (Peyman et al., 2018; Salari et al., 2016; Susanto et al., 2019). The participants with a higher level of education can make decisions and have the power to control and judge, which enhances self-efficacy (Artino, 2012).

In this study, marital status was negatively correlated with SCSES, in which the married patients had the lowest level of SCSES. This result could be interpreted as most of the participants were married who had many responsibilities towards their families, work, social interaction, and others. They take care of themselves and others, which could affect their self-efficacy (Bunge, 2012). On the contrary, Ejadi et al. (2018) showed that self-efficacy had no statistical correlation with marital status. This study revealed that marital status is one of the predictors that affect self-efficacy.

Concerning the correlating factors of SCBs, this study demonstrated that SCBs were positively correlated with age, which indicates that advancing age leads to higher self-efficacy. This result had similar findings to Ma's (2018) study, which found that middle-aged patients had more excellent self-care than young adults. Otherwise, other previous studies demonstrated low SCBs associated with increasing age or older age (Mazar et al., 2020; Peyman et al., 2018; Tawalbeh et al., 2018; Tawalbeh et al., 2017; Xie et al., 2020; Zinat et al., 2016). The potential interpretation of this finding is that the majority of the study participants in the middle-aged adult who have the capacity to make decisions and responsibilities for their care (Strough & Bruine de Bruin, 2020). Also, age was considered as a predictor for SCBs in this study.

This study showed that SCBs and duration of disease had a significant positive association, which reflects that long history of disease is linked with high SCBs. This result is compatible with previous studies among Jordanian patients with HF (Tawalbeh et al. 2018; Tawalbeh et al., 2017) that showed low SCBs were associated with shorter disease duration (Tawalbeh et al., 2018; Tawalbeh et al., 2017). This finding could be interpreted as patients experienced heart diseases for more extended periods of time may have gained more experience, leading to a greater understanding of their disease (Beker et al., 2014).

The present study showed a positive correlation between SCBs and marital status, implying that married patients had better SCBs. Tung and colleagues (2012) revealed that married patients reported better self-care management and confidence than single patients. On the contrary, the study result is incompatible with previous studies that documented that single patients had the best SCBs (Asadi et al., 2019; Shojaee et al., 2009). The potential interpretation of this finding might be related to married patients in eastern Arab society getting assistance in performing their care behaviors from their families (Padela & Zaidi, 2018).

This research found a positive correlation between SCBs and social support, indicating that patients with high social support had better SCBs. This finding is congruent with the results of earlier studies (Bahari et al., 2019; Hu et al., 2015; Gallagher et al., 2011; Lee & Park, 2017). Gallagher et al. (2011) concluded that patients who had a high degree of social support were more likely to seek advice from healthcare professionals for weight loss, limiting the amount of consumed fluids, taking medications, getting flu vaccine, and practicing exercise regularly. Family and friends can make a significant difference in patients' life and health orientation, resulting in higher SCBs (Hu et al., 2015). Also, social support was a predictor for SCBs, which agreed with the results of the Tawalbeh et al. (2017) study.

The study's findings revealed a negative and statistically significant correlation between SCBs and anxiety, reflecting that patients with high anxiety levels had low SCBs. Similar to Celano et al. (2016) study that found low SCBs correlated with high anxiety levels. On the contrary, there was no any correlation between SCBs and pressure (Moreover et al., 2015). The relationship between anxiety levels and cardiovascular health is complicated. Individuals who have experienced anxiety are more engaging in risky and unhealthy behaviors (Celano et al., 2016). Furthermore, anxious patients are less likely to participate and adhere to cardiac recovery techniques and programs (McGrady et al., 2009).

Additionally, the study found a significant effect of self-efficacy (PEPPI-5, SEMCD-6, and SCSES) on SCBs among patients with CAD. These results are compatible with previous evidence (Bahari et al., 2019; Chen et al., 2020; Hu et al., 2015; Lee & Park, 2017; Ma, 2018; Peyman et al., 2020). Self-efficacy is considered as a factor in changing SCBs (Evangelista & Shinnick, 2008; Sol et al., 2010). Self-efficacy was beneficial in changing the health behaviors of patients with CVDs. Better self-efficacy through applying healthier lifestyle behaviors can improve the health status of patients with CHD (Jackson et al., 2014; Wantiyah et al., 2020).

Implications for Practice

This study can provide a baseline information and appropriate assessment of self-efficacy and SCBs in patients suffered from CAD in Jordan, and their correlation with demographic and psychosocial factors, which may be

necessary for healthcare professionals in setting priorities for developing health programs and strategies to promote self-efficacy and SCBs in those patients. The study findings would contribute to the literature by providing information on self-efficacy and SCBs and factors correlating with these areas among patients with CAD.

This study focused on importance of self-efficacy in enhancing SCBs. Also, the significance of controlling the correlating demographic and psychosocial factors to enhance self-efficacy and SCBs.

The results of this study proposed that healthcare professionals must enhance the self-efficacy among all patients experienced CAD in order to improve SCBs. Also, they should address the correlated factors to positively influence CAD self-care.

Health screening focused on the psychosocial aspects in patients with CAD patients could help identify depression, anxiety, and stress symptoms. In addition, strategies for increasing self-efficacy and self-care behaviors are being developed.

The study results enable nurses and other healthcare professionals to recognize the challenges of patients with CAD. As a result, they can establish educational programs and behavioral therapies that emphasize the psychosocial situations of those patients to help them adapt with their CAD and improve self-efficacy and SCBs.

IV. Conclusions

Self-efficacy and SCBs play a critical role in patients with CAD. The present study purposed to assess the self-efficacy and SCBs levels in patients experienced CAD in Jordan, as well as the correlation between selected demographic and psychosocial variables and self-efficacy and SCBs.

The present study's findings propose that more attention should be paid to correlating factors and working on eliminating the effects of these factors to help improve self-efficacy, which has the greatest influence on enhancing SCBs. Social support should be evaluated on a regular basis because it is the most important factor, which can influence self-efficacy and SCBs.

Recommendations

These recommendations were suggested depend on the findings of the current study:

- Plan for health educational programs and strategies to enhance self-efficacy and SCBs among patients with CAD and train the healthcare professionals on these programs.
- Develop health promotion and education training focused on evidence-based practice and theories to improve self-efficacy and SCBs. These programs help improve the knowledge and understanding of patients with CAD about the importance of self-efficacy and SCBs in enhancing their health status and avoid future complications.
- Develop effective and secure behavioral and psychotherapeutic approaches to minimize the psychological problems (e.g., depression, stress, and anxiety) among those patients. Also, social support should be considered in any treatment programs.
- Repeat the study using a random selected sample of patients with CAD to enhance generalization of the results.
- Conduct future qualitative research to assess the self-efficacy and SCBs of the patients suffered from CAD, as well as the role of demographic and psychosocial factors in improving self-efficacy and SCBs.
- Conduct research to assess the effect of the designed educational intervention programs in increasing the skills of self-efficacy and SCBs in patients experience CAD.

Limitations

This research study has the following limitations:

- The cause and effect of the study variables can't be determined using a cross-sectional design. Thus, other designs such as longitudinal could be utilized in future studies.
- Despite this study included various health sectors and various different geographical areas in Jordan, a convenience sampling method was adopted, which could influence the generalizability of the findings of study.
- Results were dependent on a self-reported questionnaire, which could lead to bias results.

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