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Quality of Life among Patients with Acute Coronary Syndrome

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Abstract
Objectives: *The purposes of this study were to describe the quality of life for patients with acute coronary syndrome in Jordan, identify the mostly affected quality of life domains and if there was an association between quality of life socio-demographic and clinical characteristics.*
Methods: *A non-experimental descriptive cross-sectional correlational design was used with a convenience sample of 372 patients with acute coronary syndrome. Data were collected from six different hospitals in Amman city by a self-reported questionnaire.*
Results: *Overall, the patients' quality of life mean score for all domains was low (4.06 ± 1.16). The physical domain was the most affected (3.87 ± 1.28), followed by the emotional (4.21 ± 1.18) and lastly is the social domain (4.26 ± 1.25). There were statistically significant differences in quality of life scores according to gender, level of education, employment status, physically activity, history of dyslipidemia and medical diagnosis.*
Conclusion: *The results of this study indicated that Jordanian patients with acute coronary syndrome have poor quality of life especially in the physical domain. Social domain of their quality of life was the least affected indicating that there is a strong family support and relation. Different treatments to improve quality of life for those patients are warranted.*
Keywords: *Acute Coronary Syndrome, Jordan, Myocardial infarction, Unstable Angina, Quality of life.*

I. Introduction

Acute Coronary Syndrome (ACS) is a Cardiovascular Disease (CVD) that occurs due to atherosclerosis (1). Acute Coronary Syndrome refers to a group of signs and symptoms compatible with acute myocardial ischemia (2). It includes unstable angina (UA), non-ST elevation myocardial infarction (NSTEMI) and ST elevation myocardial infarction (STEMI) (3, 4). Acute Coronary Syndrome is one of the leading causes of death and disability worldwide, accounting for approximately seven million deaths and 129 million disabilities annually (5, 6). Acute Coronary Syndrome affects many aspects of patient's life including, including: physical, psychological, emotional and social (7) .

Quality of life is a diverse phenomenon and is generally understood in terms of how patients perceive their physical, mental and social life in relation to their illness and treatment (8). In patients with ACS, quality of life is usually used to measure the impact of ACS and its treatment on patients' perceptions to their physical, emotional and social functioning over time (9). Assessing these functioning domains addresses what type of care is needed to maintain patients' physical, mental, emotional and social status (10).

Most of the studies about quality of life for patients with ACS were done in developed countries. The results of these studies may or may not be applicable to the people at the developing countries. Moreover, ACS is responsible for the majority of the CVDs deaths worldwide including Jordan (5, 6). Therefore, the major purpose of this study was to describe the QoL for patients with ACS in Jordan. Furthermore, the study aims to identify the mostly affected quality of life domains and if there was an association between quality of life, socio-demographic and clinical characteristics.

II. Methods

A. Design

A non-experimental descriptive cross-sectional design was used to meet the objective of this study.

B. Setting

The health care system in Jordan includes four major sectors: ministry of health, royal medical services, private sector and the teaching. For the purpose of representative sampling, six hospitals (two public, one military, one teaching and two private) were selected. These sites are covering the whole country and considered as tertiary care centers for heart diseases.

Ethical considerations

The study was approved by the Institutional Review Board (IRB) committee from the University and all hospitals prior to data collections. .

C. Sample and Sampling

A non-random convenience sample was used to recruit patients. All patients who met the flowing inclusion criteria were invited to participate: a) diagnosed of ACS (MI or UA), b) Older than 18 years, c) Mentally and hemodynamic stable, d) have no chronic diseases except hypertension (HTN), diabetes mellitus (DM) and dyslipidemia, e) able to read and write Arabic, f) signed an informed consent.

To make sure that the sample size is sufficient to get statistically significant results , sample size was calculated using power analysis software with a power of 0.8 and a medium effect size, and an α of 0.05. Based on these criteria a sample size of 300 patients was enough to detect a significant result. A total of 410 patients were approached; 390 patients consented and agreed to participate in the study. Among those 372 returned the questionnaire and were included in the final analyses ending with a response rate of 90.73%.

D. Measurements

Quality of life was measured by the *Arabic version of MacNew heart disease health related Quality of life (MacNew):* This instrument specifically measures quality of life for patients with heart diseases. This instrument consists of 27 items distributed on three major domains (physical, emotional and social). The participants rate their response on a likert scale for each item form one to seven. The global score for the instrument range from 7 to 189. After that the mean of the global score was calculated ending with a minimum score of one, indicating low QoL and maximum score of seven, interpreted as high QoL. For the physical domain the score was calculated by the mean score of the 13 items representing the domain. The emotional domain was calculated by the mean score of the 14 items representing the domain. The social domain was calculated by the mean of the 13 items representing the domain. It is necessary to note that there are some items included in more than one domain. MacNew provides a normative reference data which recently updated and published to help authors to interrupting their study result (11).

The Arabic version of this instrument has very good psychometric proprieties. Rawas (2015) reported that the Arabic version of the MacNew had an internal consistency (Cronbach's alpha) of ≥ 0.91 for each domain of the MacNew and the global score. Moreover, the results of test retest reliability on a sample of 58 patients ranged from 0.81 to 0.87. The conclusion of this study was that the Arabic version of t the MacNew is valid and reliable.

Socio-demographic and clinical characteristics check list was used to collect information about
patient's medical diagnosis, age, gender, marital status, educational level, employment status, exercise level, body mass index (BMI), and chronic illnesses.

III. Data Analysis

Data was analyzed using the Statistical Package for the Social Sciences (SPSS 21). Before proceeding with the analysis, a reliability of the questionnaire was checked and a Cronbach alpha was 0.92. Consequently, the reliability for each domain was checked and a Cronbach alpha was 0.88 for physical domain, 0.87 for both emotional and social domains, suggesting a high reliability of all items combined and each domain.

Descriptive statistics (frequencies, means, percentages, and standard deviations) were used to describe the sample characteristics. Independent sample t-test and one way ANOVA were used to identify any significant difference in QoL according to patients' socio-demographic and clinical characteristics.

IV. Results

Socio-demographics and clinical characteristics of the sample (N=372) are presented in table 1. The age of the patients ranged from 30 to 83 years, with a mean age of approximately 55 years. Most of the patients were married (86.8%), male (67.2%) and working (59.7%). Approximately 42.7% of the patients had secondary school and below and 26.3% had high school qualifications. More than two third of the participants were categorized as overweight and obese and only one fifth of the sample reported conducting regular exercise. More than half of the patients (54.8%) were suffering from HTN, 40.6% had DM and 54.0% reported dyslipidemia.

<Table 1 here>

E. Quality of life of Jordanian patients with ACS

The global score of the QoL was (4.06 ± 1.16). The physical domain was the domain with the lowest score (3.87 ± 1.28), followed by emotional (4.21 ± 1.18) and finally, the social domain (4.26 ± 1.25).

F. Differences in QoL according to patients' socio-demographics and clinical characteristics

Quality of life global score significantly differed among different medical diagnosis, gender, employment status, dyslipidemia, exercise and educational status of the patient. Patients diagnosed with MI had significantly higher QoL global score than those diagnosed with UA (4.23 ± 1.07 vs. 3.78 ± 1.13, t (3.877), P < 0 .001). Additionally, female patients had significantly lower QoL global score than male patients (3.66 ± 1.08 vs. 4.25 ± 1.08; t (- 4.893), $P < 0.001$).

Furthermore, unemployed patients had significantly lower QoL MacNew global score than employed patients (3.76 ± 1.06 vs. 4.26 ± 1.11, t (- 4.361), $P < 0.001$). Moreover, the study reported that the patients having dyslipidemia in their medical history had significantly lower QoL MacNew global score than those who did not have dyslipidemia (3.85 ± 1.08 vs. 4.29 ± 1.11, t (-3.856), $P < 0$ .001). Finally, the study found that the patients who did not practice exercise had significantly lower QoL MacNew global score than patients who did practice exercise (3.91 ± 1.08 vs. 4.60 ± 1.09, t (- 4.955), $P < 0$ .001).

The global scores of QoL of patients did not differ among the remaining socio-demographic and clinical characteristics (age, marital status, BMI, HTN and DM).

Tables 2 and 3, illustrates the impact of educational level on patients' QoL. Results indicated that there was a statistically significant main effect for the educational level: [f (4, 367) = 8.90, $P < 0.001$]. Post-hoc comparison tests indicated that patients who had secondary school and below were responsible for the main effect. The QoL MacNew global score for this group was significantly lower than postgraduate groups.

<Table 2 here>

<Table 3 here>

V. Discussion

This is the first study that was designed specifically to describe the QoL for patients with ACS in a developing country; Jordan. The findings showed that the mean global score was (4.06 ± 1.16). This result indicated that those patients have poor QoL because these scores are lower than the scores of many studies around the globe with similar health conditions. The mean global score ranged from (4.66 ±1.0) in Eastern Europe to (5.29 ±1.0) in Scandinavia (12). Furthermore, the mean global score in this study was also lower than the mean global scores obtained from patients in many countries such as Canada, United States, Switzerland, Austria, Brazil and Turkey (13-16).

These results could be from the seriousness of ACS diagnosis and its link with death in many cases (17). Difference in health care systems among countries and the resources provided for patients may affect their QoL (18). Cultures differences and living context may impair QoL in normal people among countries. Compared to the developed countries, Jordan as a developing country has limited resources and health insurance to the citizens. Moreover, Jordan is considered one of the most expensive countries not only in the Middle East but all over the world compared to the income. Taking all these factors into consideration, no wonder that Jordanian patients with ACS have poor QoL scores in comparison with patients from other countries.

Among the three QoL domains, the physical domain had the lowest QoL score. These results are compatible with other studies (19, 20). As documented in other studies, the ACS signs and symptoms affect patents' physical functions and impair their physical ability (21, 22). Having a diagnosis of ACS represents a life-threatening event that may result in physical limitations due to the signs and symptoms of the disease (e.g. chest pain, difficulty in breathing, and the inability to perform a physical activity). Acute coronary syndrome may also result in emotional and social impaired functioning due to feelings associated with fears from death and losing families (i.e. inability to maintain family commitments and relationships) (23). It seems logical for participants to report low QoL scores in the physical domain, because of the illness-related factors mentioned above, and the fact that around 80% of the patients have never been engaged in any physical exercises. This result is supported by another Jordanian study (24), which aimed to assess the learning needs among ACS patients. Eshah (24) indicated that participants did not recognize the importance of physical exercise to improve their physical functioning and they classified it as a low priority among other needs.

The other two domains (social and emotional) were presented with similar QoL global score and they were higher than the score for the physical domain. These findings contradict the results of other authors (16), which reported that the disease impacts on QoL were the same across the different domains. However, other studies reported that the social domain had the highest score in comparison to the physical and emotional domains (25, 26). However, this study did not corroborate those findings, possible due to the underlying Jordanian cultural domain. Jordanians tend to hide their emotional feelings during illness from their families and the public, and they try to avoid asking for social and emotional support (27). Additionally, Jordanian patients

usually receive good support as a matter of course from their relatives, especially first-degree relatives, based on the religious and socio-cultural purposes (27). It should be noted that while the social and emotional domains obtained better scores than the physical, these were still lower scores of the global studies (12). This could partly result from the shortage in informational programs and rehabilitation services in Jordan. Eshah (24) reported that Jordanian patients with ACS indicated a high need for information about their ACS diagnosis before being discharged from the hospitals. This shortage in information may affect their adaptation process with the new situation and may decrease their chances to learn about their disease and how to adopt a healthy lifestyle (28).
The study found that QoL global score among UA patients was significantly lower than MI patients. This result seems to be in agreement with the findings of some other studies (29, 30). The clinical characteristics presented among UA versus MI patients may explain these findings. Unstable Angina patients experience several anginal attacks that increase in intensity over time. They also experience recurrent cardiac events and they have more co-morbidities and extensive coronary diseases that result in long term prognosis associated with poorer health status (31, 32). Myocardial infarction is always more severe than UA and is a life-threatening episode, which mandate the patients to seek immediate medical treatment and therapeutic management. This medical and therapeutic management may positively impact their QoL, contrary to UA patients, whose conditions result in delayed or less medical attention and consequently result in lowering their QoL (30).

Consequently, findings showed that male patients scored higher QoL than female patients. This result is consistent with other studies (33, 34). Female patients usually show lower level of coping with illness compared to male patients and they use different coping mechanism (35). Other researchers reported that the complications of ACS are greater in female patients than in male patients (36). The complications of the disease may lead to worse outcomes and therefore lower level of QoL (37). Furthermore, female patients are usually more depressed following ACS events compared to male patients. This depression negatively affects the QoL for females compared to males (38, 39).

Unemployed patients reported lower QoL MacNew global score than employed patients. This is supported by another research study that examined the impact of working status on QoL for patients with coronary heart disease (40). This finding could be caused by the functional limitations and physical deficiencies caused by the disease, which may affect patients' ability to work. The ACS clinical presentations (e.g. chest pain and shortness of breath) directly affect patients' ability to perform tasks related to daily life activities such as working (33). Consequently, the perception of inability to work among non-working patients may affect their lifestyle and their self-image, and hence their QoL. Yuval, Halon & Lewis (41) examined ACS patients' perceptions toward lifestyle changes and their desire to return back to work after being discharged from hospital and reported that the majority of patients expressed low confidence levels, poor self-image, high anxiety level and major impact on their lifestyle. The study concluded that ACS traumatically affected those patients and resulted in prolonged changes in their lifestyle which negatively affected their desire to return to work and significantly compromised their QoL.

In line with previous studies, the result of this study showed that the global MacNew score for the patients with dyslipidemia was significantly lower than for those without dyslipidemia (42-44). Different possible explanations exist in the literature. One of them is that cholesterol was identified as one of the CVDs risk factors and it is considered to be a major cause of atherosclerosis (45). Montalescot et al. (46) identified that the untreated dyslipidemia as the strongest predictor of hospital deaths among patients suffering from ACS. Another explanation is that dyslipidemia is associated with a generally unhealthy lifestyle; patients with dyslipidemia are usually obese, physically inactive, and have unhealthy eating habits (47). Based on this, increasing the prevalence rate of dyslipidemia among ACS patients may be correlated with unhealthy lifestyle and may develop physical and psychological disorders or other cardiac complications which may affect patients' QoL (28, 48).

The mean global MacNew score for patients who were physically inactive and not performing exercises was lower than those patients who used to do exercise. Several studies supported this finding (49-51). Physical inactivity is considered to be a behavioral risk factor in CVDs, and a lifestyle component that is associated with poor prognosis in ACS as well as QoL (50, 52, 53). Adjustment for these factors through lifestyle modification, such as increasing sport activities, has a great effect on the patients' health status and leads to better QoL outcomes (52, 54-57). The current study found that patients who were physically inactive had higher prevalence rates of HTN (56.4%) and dyslipidemia (57.8), which may have compromised their health status and affected their QoL.

Finally, the study reported that patients with secondary school educational level and below scored the lowest mean global MacNew score, while those with postgraduate education scored the highest. This shows that the higher the educational level, the higher the QoL, corroborating the findings of previous studies (36, 49, 58-60). Low educational level was associated with poor perception of the disease and its risk factors. Patients with lower levels of education may face difficulties in reading, understanding or following instructions given in the

hospitals or presented in their medication leaflets. This might be associated with misuse of their medication or decreased awareness toward healthy lifestyles, which may affect their health status and their QoL (58, 61, 62).

VI. Conclusions

The present study identified that the Jordanian ACS patients had impaired QoL in general and in the three domains. Among these domains, the physical domain was the mostly impaired; while approximately similar mean scores for both emotional and social domains were observed. Consequently, the study found that QoL level differs among some socio-demographic and clinical characteristics of the participants. Finally, the Arabic version of the MacNew QoL was found to be applicable to cardiac patients in the Jordanian community.

Competing interests

The authors declare that they have no competing interests

II. TABLES

Table 1: Socio-demographics and clinical characteristics of the patients (n=372)

Characteristics	**Mean ± SD or % (N)**
Global score:	4.06± 1.16
Physical score	3.87±1.28
Emotional score	4.21±1.18
Social score	4.26±1.25
Medical diagnosis:	
Unstable angina	39.0 % (145)
Myocardial infarction	61.0% (227)
Age (years)	55.20 ± 10.45
Gender:	
Male	67.2% (250)
Female	32.8% (122)
BMI	28.48 ± 5.82
Employment status:	
Yes	59.7% (222)
No	40.3% (150)
Dyslipidemia:	
Yes	54.0 % (201)
No	46.0 % (171)
Exercises:	
Yes	20.4% (76)
No	79.6% (296)
High blood pressure:	
Yes	54.8% (204)
No	45.2% (168)
Diabetes:	
Yes	40.6 % (151)
No	59.4% (221)
Marital status:	
Single	3.2% (12)
Married	86.8% (323)
Divorced	2.7% (10)
Widowed	7.3% 27)
Educational level:	
Secondary school and below	42.7% (159)
High school	26.3% (98)
Diploma	12.4% (46)
B.Sc	14.0% (52)
Post graduate	4.6% (17)
BMI categories:	
Underweight	1.6 % (6)
Normal	25.3 % (94)
Overweight	37.4 % (139)
Obesity	35.8 % (133)
Note: SD= standard deviation. N= number of participants	

Table 2: Difference in QoL MacNew global score according to educational level of the patients (n=372)

Educational level	N	Mean ± SD	F	p-value
Secondary school and below	159	3.7407 ± 1.15	8.90	$P < 0.001$
High school	98	4.0306 ± 0.98		
Diploma	46	4.4089 ± 0.94		
B.sc	52	4.5518 ± 1.11		
Post graduate	17	4.6719 ± 1.04		
Note: SD= standard deviation. N= number of participants The table above presented the result of one way ANOVA				

Table 3: Post-hoc test of QoL MacNew global score across different educational level (n=372)

Educational level		Mean difference in the educational level	P-value
Secondary school and below	High school	-0.29	0.219
	Diploma	-0.67	<0.01
	B.Sc	-0.81	<0.001
	Post Graduate	-0.93	<0.01
High school	Secondary	0.29	0.219
	Diploma	-0.38	0.280
	B.Sc	-0.52	<0.05
	Post Graduate	-0.64	0.154
Diploma	Secondary	0.67	<0.01
	High school	0.38	0.280
	B.Sc	-0.14	0.965
	Post Graduate	-0.26	0.909
B.Sc	Secondary	0.81	<0.001
	High school	0.52	<0.05
	Diploma	0.14	0.965
	Post Graduate	-0.12	0.995
Post Graduate	Secondary	0.93	<0.01
	High school	0.64	0.154
	Diploma	0.26	0.909
	B.Sc	0.12	0.995

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