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Original Article

Knowledge and Satisfaction for Patients Undergoing Coronary Angiography at Surgical Specialty Hospital Cardiac Center in Erbil City

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ABSTRACT

Background and objectives: Patients' satisfaction is a vital indicator of the quality of health care. Nevertheless, current data on determinants of satisfaction in invasive procedures for the cardiac patients are deficient. Accordingly, this study aims to assess the knowledge and satisfaction level of patients who undergoing coronary angiography.

Methods: A descriptive/cross-sectional study design was carried out among 350 coronary heart disease patients who performed coronary angiography at the surgical specialty hospital cardiac center in Erbil City. The study begins from of January 2023 to the 7th of August 2023. The data was collected via using a questionnaire which included patients' characteristic data, knowledge about coronary angiography and patient satisfaction questionnaire. The collected data were analyzed via the frequency and percentages, mean and standard deviation, also the researcher used the Chi-square, independent t-test and one-way analysis of variance (ANOVA) also binary logistic regression analyses were performed.

Results: Presented higher service satisfaction scores were found in younger patients, male, more educated, and with high monthly income respectively, The overall degree of satisfaction with coronary angiography care was 57.4 % while 42.6 % of the patients were dissatisfied with coronary angiography care, The factors affecting patient dissatisfaction were lack of patient trust (P-value =0.027, OR=0.499), not ensuring privacy during the procedure (P-value 0.003, OR=0.447), unacceptable waiting time for admission (P-value <0.001, OR=5.857) and high costs procedure (P-value <0.001, OR=4.052).

Conclusion: More than half of patients are satisfied with coronary angiography care despite most of them having inadequate knowledge.

Keywords: Knowledge; Satisfaction; Coronary angiography.

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INTRODUCTION

Henceforth coronary heart disease (CHD) is one most common causes of mortality worldwide, annually, is estimated 17.9 million lives. More than four out of five CHD deaths are due to heart attacks and stroke, and one-third of these deaths occur prematurely in people under 70 years of age [1]. In Iraq, the number of CHD is increased and considered as a health problem according to data provided the Iraqi Ministry of Health in the hospitals morbidity it was shown that 65% increase in hospital admission due to coronary heart disease [2]. Thus, the Coronary angiography (CAG) is considered as a gold standard diagnostic procedure to identify the function of the heart, structural disorders, and main blood vessels. The coronary angiography is an imaging method that requires the insertion or introduce of the contrast media into the catheter into arterial or selected blood vessels. Also, it used to detect the coronary artery structure and assess the intensity or grade of lesions from atherosclerosis [3]. Therefore nowadays, it has become evident that the care of hospitalized patient's with the heart disease doesn't regarded as merely as a preventing from the complication of the disease and inadequate to the management of the illness but too includes evaluate of needs for the establishment of a higher level in quality care [4]. The health care services, patients' satisfaction have become the most important and challenging competitive elements. Health care providers are presumed to offer both high quality of care and exceed clients' expectancy while being price conscious and effective [5].Cardiovascular diseases trajectory affects not only the patient but their family members, community and relationships with others too [6]. Patients who attend cardiac clinics need to have information, from those who experience and suffer from psycho-social needs, moreover, they regularly need significant management concerning medication [7]. Realizing the experience of patient gives the healthcare provider the chance to improve a higher level of patient satisfaction. The most important and the key indicator of the improvement in quality of care and delivery, health system consistency, reliability and well-being is patients' satisfactions [8]. The level of patient satisfaction in Iraq is expected to be worse [9], probably for the reason that the health care systems undeveloped have an inadequate capacity in offering appropriate and more effective health care also insufficient support to the health institutions. Noticeably, there is an inadequate number of healthcare professionals to increase the number of patients. Moreover, the insufficient availability of drugs and laboratory investigations lead to more burden. in the end, the patient's trust, keeping privacy, waiting time, patients teaching markedly affected patients' satisfaction. Thus, and due to the mentioned facts the study aimed to determine patients' satisfaction and knowledge level toward coronary angiography care and factors associated with dissatisfaction.

METHODS

The present study was a cross-sectional design which was carried out on patients with coronary heart disease (CHD) who performing coronary angiography at Cardiac Center in Erbil City. The current study started at the beginning of January 2023 to 7th August 2023. An ethical approval from the ethical committee was taken from Hawler Medical University at the College of Nursing. In the study areas, the investigator carefully chosen the participants and asked them to contribute to the study. The sample was present and aware of the study's purposes, and the voluntary character of their involvement,

and the researcher informed all patients was taken confidentiality and privacy in their responses. They were told that they might reject or end up participating at any time without no experiencing any consequences. The total sample was (n=350) coronary heart disease patients and was carefully chosen with a purposive sampling method according to the inclusion criteria of the study. The participants of this study were patients who were ready and want to participate in the study, adult patients diagnosed with coronary heart disease, who need coronary angiography for the first time, and being conscious. While the exclusion criteria were patients who had unstable conditions, receiving any other invasive procedure and unable to give consent. The simple formula was used to calculate the suitable sample size in the prevalence study at Duhok Heart Center, Kurdistan-Iraq, who examined clinically diagnosed CAD patients who underwent coronary angiography (CAG); n=Z2P (1−P)/d2. Where n is the sample size, Z is the statistic corresponding to the level of confidence, P is the expected prevalence or proportion, and d is corresponding to the effect size, sample size 3.841*0.31*0.69/0.0025= 328 [10]. The questionnaire contains three parts. The first part which consisted of the general information (demographical data) which includes (age, gender, educational level, occupational status, monthly income, residency and cigarette smoking). The second part was to determine the knowledge of patients about coronary angiography, which included (21 items), pre-coronary angiography (8 items), intra-coronary angiography (4 items) and post-coronary angiography (9 items). The patient responds to each item with the right answer (one score) and for the wrong answer (zero scores), the total maximum score is 21. The overall level of knowledge has been distributed into two categories based on the knowledge score: inadequate knowledge 50% and adequate knowledge >50% [11]. The final section of the questionnaire is about patients' satisfaction, which was measured by PSQ- 18 scale, is a standard patient satisfaction questionnaire [12]. Seven different categories for evaluation include various domains of satisfaction (2 items) of general satisfaction, (4 items) of technical quality, (2 items) of interpersonal aspect, (2 items) of communication, (2 items) of financial aspect, (2 items) of time spending, and (4 items) of accessibility and convenience. Answers for each item were based on 5 choices, The Likert scale 5-point rating for measuring level of satisfaction was used on a range from (strongly disagree to strongly agree). A scale from 1 to 5 was used to calculate the mean of the scores. The overall satisfaction scale score was divided into two main categories: satisfaction (equal to or above the mean) and dissatisfaction (below the mean). The total scores for items involved in each domain were displayed and calculated as the mean. Through using this formula like [mean□100/5], it was transferred into a percentage level of satisfaction. To analyze the data from SPSS software version 27 was used. A significant level that is less than or equal to 0.05 is considered. To describe the variables of frequency and percentages and to analyze the quantitative data, the mean and standard deviation were used. Also, one-way analysis of variance, the chi-square and independent t-test, and additionally, binary logistic regression were performed (dependent variables). The level or grade of patient satisfaction as measured through using the stander tools (PSQ-18 Scale) score (the dependent/outcome variable) and the independent factors (patient's trust, fear of the procedure, privacy during the procedure,

waiting time for admission, high costs procedure, procedure explanation, discomfort and irritability) the adjusted odd s' ratio was used to comparing, the influence of factors on the outcome/consequence dissatisfaction.

RESULTS

Table 1. Description of demographic information of coronary heart disease patients. A total of 350 coronary heart disease patients visited Surgical Specialty Hospital-Cardiac Center to perform coronary angiography. The minimum age of participants in the study is 31 years and maximum was more than 60 years old and the mean age with a standard deviation of the sample was 58.97±8.99, The highest percentage of studied coronary heart disease patients were male, (54%) were uneducated, (24.9%) was governmentally employed, 56% their insufficient monthly income, (68.6%) coming from urban, 54.3% was non-smoker, concerning patient's knowledge about coronary angiography (61.9%) had inadequate knowledge while (39.1%) of them had adequate knowledge. In regard, the severity of the number of coronary artery stenosis, a higher proportion of (48%) had moderate (50 % to 69 %) of the coronary artery was obstructed. Regarding the result of coronary angiography, a higher percentage of (57.7%) were diagnosed as percutaneous coronary intervention and (18.3%) of the coronary artery bypass graft.

Table 1. Demographical data of coronary heart disease patients

Variables		N (%)
Age group (Years)	31-45	72(20.6)
	46-60	84(24.6)
	>60	194(54.4)
Gender	Male	214(61.1)
	Female	136(38.9)
Level of education	Uneducated	189(54)
	Educated	161(46)
Occupation	Governmental employed	87(24.9)
	Self-employed	80(22.9)
	Unemployed	29(8.3)
	Retired	34(9.7)
	Housewife	120(34.3)
Monthly income	Insufficient	196(56)
	Sufficient	154(44)
Residency	Urban	240(68.6)
	Rural	110(31.4)
Cigarette smoking	Non-smoker	190(54.3)
	Current smoker	52(14.9)
	Ex-smoker	108(30.9)
Patients' knowledge about coronary angiography	Adequate knowledge	137(39.1)
	Inadequate knowledge	213(61.9)
Coronary artery severity of stenosis	Mild (<50%)	105(30)
	Moderate (50%–69%)	168(48)
	Severe (≥70%)	77(22)
Therapeutical options	PCI	202(57.7)
	CABG	64(18.3)
	OMT	84(24)

PCI (Percutaneous Coronary Intervention); CABG (Coronary artery bypass graft), OMT (Optimal Medical Therapy)

The rating and scoring of study participants on each domain of the level of patient satisfaction were shown in [Table 2]. The high proportion (63.7%) was taken in the general satisfaction domain, compared to the domain that measures the amount of time spent with the physician, with health care personnel, which had a lower percentage (41.1%). Moreover, more than half a percentage of those were dissatisfied with technical quality (52.6%), interpersonal aspect (56%), communication (56.3%), and financial aspect (53.1%) respectively. While (50.9%) of them were satisfied with accessibility and convenience domain in general, the highest percentage of satisfaction was (57.4%) of patients satisfied with coronary angiography care whereas (42.6%) of them wquality (P-value=0.037) interpersonal

Table 2. Description of patient satisfaction in different domains

Domains of satisfaction	Dissatisfied N(%)	Satisfied N(%)
General satisfaction	127(36.3)	223(63.7)
Technical quality	184(52.6)	166(47.4)
Interpersonal aspect	196(56.0)	154(44.0)
Communication	197(56.3)	153(43.7)
Financial aspect	186(53.1)	164(46.9)
Time spending	206(58.9)	144(41.1)
Accessibility and convenience	172 (49.1)	178(50.9)
Overall satisfaction	149(42.6)	201(57.4)

Table 3. Display compares patient's knowledge regarding coronary angiography and satisfaction, patients who had adequate knowledge significantly had more satisfaction than those who had inadequate knowledge in the general satisfaction domain (P-value <0.001), technical aspect (P-value=0.013), communication (P-value<0.001) and in accessibility and convenience (P-value=0.023), whereas there was no statistically significance found in the domain of financial aspect (P-value =0.217), time spent with doctor (P-value =0.880).ere dissatisfied.

Table 3. Comparison patient's knowledge of coronary angiography and satisfaction

Domains of satisfaction	Inadequate knowledge	Adequate knowledge	Mean difference	P-value
General satisfaction	2.16±1.38	2.82±1.66	-0.66	<0.001
Technical quality	2.44±1.35	2.77±1.51	-0.33	0.037
Interpersonal aspect	2.24±1.25	2.64±1.55	-0.40	0.013
Communication	2.01±1.24	2.59±1.54	-0.58	<0.001
Financial aspect	2.86±1.09	3.04±1.49	-0.18	0.217
Time spending	2.45±1.57	2.75±1.68	-0.30	0.880
Accessibility and convenience	2.57±1.43	2.95±1.57	-0.38	0.023

Table 4. Distribution the level of satisfaction of coronary heart disease patient with demographic information, the result indicates that younger patients (53.90±17.99) are more satisfied than older patients (41.78±20.82). In regard gender male patients, (54.25±20.63) significantly had higher level of satisfaction than female (43.80±20.09).The study found that participants who were educated (53.32±20.75) revealed highest levels of patient satisfaction with coronary angiography care when compared to uneducated persons (41.45±19.26). Participants who had insufficient monthly income (43.82±19.78) expressed lower satisfaction than patients with sufficient salary (51.04±21.26). In regard [Table 5] the findings show that factors associated with patient dissatisfaction in coronary angiography care, it has been found that there was a significant association between dissatisfaction with coronary angiography care, partial inpatient trust (61.4%, P-value <0.001), inadequate privacy during the procedure (64.5%, P-value <0.001), disagreeing waiting time for admission (52.5%, P-value <0.001), high costs of procedure (49.6%, P-value <0.001), inadequate explanation about the procedure (55.1%, P-value <0.001).Table 6. Summarizes the logistic regression of factors affecting ratings on the lower satisfaction were constructed to evaluate the association among selected variables and dissatisfaction with coronary angiography care. The variables chosen in the model were based on the bivariate analysis. The factors were put into the model discomfort and irritability, patient trust, fear of the procedure, inadequate privacy, waiting time for admission, high costs procedure and not explaining the procedure were put into the model. Model fit was measured by the likelihood ratio statistic ($\chi 2$= 7.66, p=0.006) and the Hosmer and Leme show test ($\chi 2$= 16.57, p=0.35), the variability observed in the target variable is explained by the regression mode was R2 = 35.2%. Patients who lacked of trust half times more chance of being dissatisfied with coronary angiography care than full patient trust, patients with poor keeping privacy during the procedure were nearly half time more likely to report dissatisfaction than those with only keeping privacy during the procedure. Compared to those who were disagreement with waiting time for admission status, nearly 6 times more likely is associated with dissatisfaction. Additionally, the person who reported high costs of procedures had 4 times more likelihood of being dissatisfied with health care service than those who agree with cost of angiography procedures. Finally, patients who had an inadequate explanation about the procedure had a 1.61 times further probability of have dissatisfied with health care services than those who received an adequate explanation.

Table 4. Comparison of demographical data and patients' satisfaction

Demographic data		N	Satisfaction Mean ±SD	P-value
Age group (years)	31-45	72	53.90±17.99	
	46-60	84	48.25±19.54	<0.001
	>60	194	41.78±20.82	
Gender	Male	214	54.25±20.63	<0.001
	Female	136	43.80±20.09	
Level of education	Uneducated	189	41.45±19.26	<0.001
	Educated	161	53.32±20.75	
Occupation	Governmental employed	87	50.24±19.11	
	Self-employed	80	49.21±22.28	0.105
	Unemployed	29	38.38±20.33	
	Retired	34	49.00±23.93	
	Housewife	120	47.21±20.10	
Monthly income	Insufficient	196	43.82±19.78	<0.001
	Sufficient	154	51.04±21.26	
Residency	Urban	240	49.24±20.74	0.068
	Rural	110	44.85±21.04	

Table 5. Factors influencing of patients' dissatisfaction in coronary angiography care

Factors		Total	Dissatis-fied N(%)	Satisfied N(%)	P-value
Discomfort and irritability	Yes	156 (44.6)	70(44.9)	86(55.1)	0.435
	No	194(55.4)	79(40.7)	115(59.3)	
Patient's trust	Lack	83(23.7)	51(61.4)	32(38.6)	<0.001
	Full	267(76.3)	98(36.7)	169(63.3)	
Fear from procedure	No	65(18.6)	23(35.4)	42(64.6)	
	Yes	285(81.4)	126 (44.2)	159(55.8)	0.194
Privacy during procedure	Inadequate	141(40.3)	91(64.5)	50(35.5)	<0.001
	Adequate	209(59.7)	58(27.8)	151(72.2)	
Waiting time for admission	Unacceptable	263(75.1)	138(52.5)	125(47.5)	<0.001
	Acceptable	87(24.9)	11(12.6)	76(87.4)	
High costs of procedure	Yes	270(77.1)	134(49.6)	136(50.4)	<0.001
	No	80(22.9)	15(18.8)	65(81.3)	
Procedure explanation	Yes	178(50.9)	98(55.1)	80(44.9)	<0.001
	No	172(49.1)	51(29.7)	121(70.3)	

Table 6. Determinants of patient dissatisfaction in coronary angiography care

Factors		P-value	OR	95% C.I. for OR	
Discomfort and irritability	Yes	0.324	0.771	0.461	1.292
	No		Ref		
Patient's trust	Lack	0.027	0.499	0.27	0.923
	Full		Ref		
Fear from procedure	Yes	0.492	1.274	0.638	2.545
	No		Ref		
Privacy during procedure	Inadequate	0.003	0.447	0.261	0.766
	Adequate		Ref		
Waiting time for admission	Unacceptable	<0.001	5.857	2.706	12.675
	Acceptable		Ref		
High costs procedure	Yes	<0.001	4.052	2.026	8.106
	No		Ref		
Procedure explanation	Yes	0.077	1.613	0.95	2.739
	No		Ref		

R2 = 35.2%, χ2= 7.66, P-valve=0.006 Hosmer and Leme show test χ2= 16.57, p=0.35

DISCUSSION

Nowadays, diagnostic and therapeutic methods for coronary heart disease has been changed quickly. In our country, the health care staff number per patient is low and that causes a reduction in the time of examination, marking numerous difficulties. In these situations, it is not easy to perform and work more professionally and efficiently as health staff. The majority of heart disease patients have no information on coronary angiography, and inadequate knowledge about cardiovascular diseases. The present finding shows more than half the percentage of the study sample was satisfied with healthcare facilities in the domain of general satisfaction, while less than half the percentage of patients were satisfied in the domain of time spent with healthcare personnel, technical quality, interpersonal aspects and communication and financial aspect. It is comparable with a study done in in Jeddah Saudi Arabia show that more than three-quarter of patients satisfied with health care services [13]. Likewise, the present study comes along with a descriptive study carried out on 340 heart disease patients at Tengku Ampuan Rahimah Hospital, in Malaysia, the study revealed that who revealed that most of the patient satisfaction were regarded the health service factors, particularly general satisfaction, convenience and accessibility," while dissatisfaction regarding the orientation of doctors, particularly the "time spent with the doctor," "interpersonal behaviors" and "communication" during counselling [14]. The present study shows that most of the patients had inadequate knowledge regarding coronary angiography care. It was aligned with the present study findings of studies [15, 16] which were conducted in Cologne, Germany and Peshawar, Pakistan respectively. It was indicated that the participants did not have sufficient knowledge about the coronary angiography. It might be due to lack of patient education before performing coronary angiography. Also, the present study demonstrated that patients' who had adequate knowledge significantly had more satisfaction than those who had inadequate the knowledge, and this was supported by study results that aimed of evaluating the conveying methods of information concerning the coronary

angiography and it was showed that most of the heart disease patients weren't well alert angiography procedures [17]. Another by study showed that deficiency in patients' aware of in what manner the coronary angiography was performed and essential cares earlier and directly after that leads the patients' to dissatisfy, and the patients can't tolerate adherence to essential care as needed and it may causes an rise in vascular access complications which are related to the procedure [18]. The findings of the current study revealed that the patient satisfaction with demographic data indicates that younger patients are more satisfied than older ones, this result is aligned with the findings of previous studies in Malaysia [14] China [19], and Rawalpindi in Pakistan [20] which are respondents of the mentioned studies who were aged fifty years, and more are about two times and a half less satisfied with outpatient clinics services than younger age groups. This the result of study demonstrations that the male patients significantly had higher satisfaction than the females, here the findings are in line with an earlier report [21] which revealed that the female patients who were more likely to have poorer coronary heart disease experience, dissatisfaction and low perception of their health care services compared with male patients. These findings are important to the public health hence they implications and require more research to understanded the sex-definite differentiations of quality in health care, providing, and eventually health consequences. Also, it was agreed with other previous findings of studies done in Malaysia [14] and Nigeria [22] exhibited male patients were more satisfied while in comparison to their counterparts, it also, revealed that male patients were more satisfied in general satisfaction and time spent with the physician. The study found that the educated patients showed to have higher levels of satisfaction with coronary angiography care as in comparison to uneducated patients. The study results in parallel with a prior study done [23] which is identified that people with higher levels of educational background were more satisfied with their medical performance in the clinical setting. This may be because the participants with higher education levels are more familiar with what the hospital offers than participants with lower levels of education. The results, here, are corroborate with [24], who found that patient education level was associated with satisfaction with care. The higher education contributes to greater responsiveness to health system care and services, ultimately leading to greater satisfaction. In addition, to what mentioned above, another study, found that educated people were statistically significant, and gained a higher score of satisfaction in healthcare facilities, also, displayed that higher satisfaction rate in PSQ-18 with hospital services and with the staff's behavior [13].The participants who had insufficient monthly income expressed lower satisfaction than participants with sufficient income, high scores of satisfaction were noted and reported in people who had sufficient salary for daily needs. The result come along with another study conducted in 2015 which its result displays that there was a significant difference between satisfaction rates in patients towards health system and services and their monthly income [25]. Also, the findings come along with a study that indicated that insufficient salaries, dissatisfaction with lower health perception, and people were significant predictions of satisfaction rates with the health care system and service [26].In this study, the factor affecting patients' dissatisfaction among all participants, was unacceptable due to the time for

admission, this results was supported by another studies done by [13,27] was acknowledged that there were no enough times and method to communicate with the clinicians and physicians as a significant aspect in their lesser of satisfaction rating with health care facilities. Also, in their study [28] showed that the patients' satisfaction rating and scores were undesirably correlated to the ready and waiting time. Likewise, this result is consistent with a study which was done in the United States, the study revealed that shorter time in waiting for care was associated with enhancing and improved satisfaction rates [29].The present study reported that the patients' trust in doctors who had chances to be fully satisfied with health care system. This finding is similar to an earlier study done by [30] displayed that patient empathy and trust was a positive correlation with patient satisfaction. Also, the result of the study in line with the study done by [31] who reports that patients completely influenced their satisfaction in coronary angiography care by experience and confidence among the health care providers. Furthermore, it has come along reported that, making sure privacy and confidentiality for essential services which is provided by the hospital had statistical be significance for patient satisfaction. Moreover, healthcare providers should offer the highest level of privacy there to improve the level of satisfaction for patients with heart diseases [32].

Conclusion

The current study concluded that younger age, female, educated and sufficient monthly income exhibited higher service satisfaction scores in comparison to patients who aged more than sixty years, male, uneducated and insufficient monthly income, respectively. In coronary heart disease, a higher level of satisfaction rating and scoring in the domain of general satisfaction in comparison to the domain had a lower rating in measures of the amount of time spent with health care personnel. Moreover, more than half a percentage of those were dissatisfied with the technical quality, interpersonal aspect, communication, and financial aspect, respectively. Whereas patients were satisfied with the domain accessibility and convenience. In general, most of the patients were satisfied with coronary angiography. To sum up, patients who had adequate knowledge significantly had more satisfaction than those who had inadequate knowledge about coronary angiography.

CONFLICT OF INTEREST

The author reports no conflict of interest.

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