Cardiac Nurses' Knowledge of the Physical Examination of Patients with Heart Failure

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ABSTRACT

The past few decades, there has been a significant increase in the clinical assessment skills to be performed by nurses, along with expansion of nurses' roles and responsibilities to enable them to have a more active contribution in patient care. The study aimed to explore nurses' knowledge regarding physical examination of patients with heart failure and to identify the possible factors influencing it.
Methods: A descriptive cross-sectional design was used, with a convenience sample of 153 nurses were included in the study. The data was collected through self-administered questionnaire.
Findings: The study findings indicate that the nurses in the study settings have low level of knowledge of the physical examination of a patient with heart failure.
Conclusion: The nurses in the study settings, particularly the Bahraini nurses, lack sufficient knowledge for proper physical assessment of the patients with heart failure. Hence, specialized training courses are recommended for these nurses, especially for the Bahraini ones. These courses should address the knowledge gaps identified to be effective.

Key Words: Heart Failure, Physical Assessment, Knowledge, Nurses

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INTRODUCTION

The prevalence rates of the heart failure (HF) are increasing in both developed and developing countries, with a prevalence rate of 2% in adult world population [1], and one in five lifetime risk [2]. The problem is even increasing with the aging of societies and increased life expectancies [3], and it is the leading cause of hospital admission in elderly persons [4]. Moreover, the burden of illness among patients with chronic HF is high, and could be even comparable to those having malignant diseases [5]. This makes it a challenge for researchers, caregivers, and policymakers. Hence, the prevention of this global health problem is taking high priority [6].

Nurses have important roles in the management of patients with HF and they should have good knowledge to be able to meet the needs of these patients as well as their families [7;8]. These roles have been recently diversified and executed at various levels and types of health care settings, with more collaboration with other healthcare professionals. These changes necessitate major changes in nursing schools' curricula concerning the care of patients with HF to be better educationally prepared for fulfilling such roles [9]. Moreover, they should be given the opportunity to fully apply the knowledge and skills they have acquired during their educational years [10]. During the last few decades, there has been

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important increases in the clinical assessment skills to be performed b
y nurses, along with expansion of nurses' roles and responsibilities to enable them to have a more active contribution in patient care [11]. Thus, in New Zealand, health assessment is one part of the nurse practitioner's roles [12]. Furthermore, nurse-led clinics for HF patients were established a study in Hong Kong and their effectiveness was demonstrated through decreased hospital readmissions as well as significantly lowered mortality among these patients [13].

In order to confirm the diagnosis of HF, it is important to conduct an initial set of assessments, lab studies, and diagnostic tests. The key part of the patient assessment is the initial medical history and physical examination. A systematic and thorough physical examination of the patient with HF is crucial in gathering important information for the nurse to make clinical judgment, and this should be continued from admission to discharge [14]. Its accuracy and completeness have significant impacts on the nursing diagnosis and care *plan* [15]. This requires professionally trained nurses able not only to assess and record patient symptoms and signs, but also to comprehend their relevance [16]. Nonetheless, studies revealed deficiency in such expertise and knowledge among nurses [17; 18] and their need for training (19; 20].

Significance and aim of the study

The literature abounds with studies examining patient's knowledge of self-management of HF. However, there is a paucity of research investigating how well nurses are equipped with adequate knowledge and appropriate for conduction of a proper physical examination of a patient with HF. Specifically, no studies have focused exclusively on this issue in Bahrain. The present study could fill this gap in the local literature, which would help nursing administrators to plan staff development programs and activities based on identified needs. Therefore, the aim of this study was to explore nurses' knowledge regarding physical examination of patients with HF and to identify the factors possibly influencing it.

SUBJECTS AND METHODS

Research design and setting:

A descriptive cross-sectional study design was used to conduct this study at two governmental hospitals in Bahrain.

Participants:

A convenience sample of 153 nurses was recruited from those working in the cardiac units were of the two hospitals. This sample size was large enough to demonstrates an expected satisfactory knowledge rate of 60% or higher among nurses, with a 95% confidence level, and a 3% standard error, using the sample size equation for estimation of single proportion, with finite population correction.

Data collection tool:

The researchers designed a self-administered questionnaire based on pertinent literature. It consisted of two sections. The first section was for nurse's personaland jobcharacteristics such as unit, age, gender, marital status, nationality, years of experience, and previous training in cardiac care. The second section was for nurse's knowledge of the physical examination of a patient with heart failure. It consisted of 18 True/False questions covering the most important aspects of physical examination. It was divided into three sub-sections covering knowledge of the inspection (10 items), palpation (4 items), and auscultation (4 items) parts of physical examination. The tool was vigorously revised by a panel of experts for the content validity and the necessary modifications were taken into consideration in tool finalization.

Procedures:

Uponsecuring official approvals, the researchers met with each participant, and provided them with the instructions concerning the filling of the data collection form. The questionnaire was filled in the study setting and in the presence of the researchers for any clarification needed, and to avoid getting help in answering the questions, which would lead to biased assessment. The nurse took approximately 10 minutes to complete the filling of the questionnaire. Data were collected over a three-month period.

Ethical considerations:

Official approvals were obtained from the administration of the two hospitals using pertinent communication channels. Oral consent was obtained from the study participants. Anonymity and confidentiality were guaranteed, with reassurance that the collected information would be used only for research purposes. The study maneuver could not induce any harm on participants. The principles of Helsinki Declaration were followed.

Statistical analysis: Data management and analysis were done using the statistical software SPSS version 20. Mann-Whitney tests and Kruskal-Wallis tests were used for comparison of quantitative data between two groups and three or more groups respectively. Multiple linear regression analysis was used to identify the factors independently influencing nurse's knowledge score. The level of statistical significance was set at $p<0.05$.

RESULTS

The sample included slightly more nurses from the hospital A units (59.5%) as shown in Table 1. Their age ranged between 18 and 60 years, with median 34.0 years. The majority were women (86.3%), non-Bahraini (71.9%), and married (84.3%). With regard to their nursing qualification, more than half of them were carry a bachelor degree (58.8%), and their median experience was 8.0 years. Slightly less than half of them (44.4%) reported having attended training in cardiac care nursing.

Table 2 indicates that the mean percent score of nurses' knowledge of inspection was the highest (73.14), whereas the lowest was for the knowledge of palpation (66.01). Overall, the mean and median percent scores of total knowledge were 70.62 and 72.22. It is also noticed that the scores of each part as well as the total knowledge ranged between 0.00 and 100.00.

Concerning the relations between nurses' knowledge and their characteristics, Table 3 points to statistically significant associations with their working units (p=0.008) and subunits (p=0.008), as well as their nationality (p=0.001). As the table illustrates, the nurses working in the hospital (A) units had higher scores of knowledge. Moreover, those working in the hospital (B) sub-unit (2) had the lowest score of knowledge. Lastly, the scores of non-Bahraini nurses were higher in comparison with the Bahraini nurses.

In multivariate analysis (Table 4), only the non-Bahraini nationality was identified as a statistically significant factor independently and positively influencing nurses' knowledge score. However, it explains only approximately 5% of the variation in this score. None of the other nurses' characteristics had a significant effect on their knowledge score.

Table 1: Socio-demographic and job characteristics of participants in the study sample (n=153)

	Frequency	Percent
Units:		
Hospital (A)	91	59.5
Hospital (B)	62	40.5
Gender:		
Male	21	13.7
Female	132	86.3
Age:		
<30	42	27.5
30-	82	53.6
40+	29	19.0
Range	18-60	
Mean±SD	34.5±7.3	
Median	34.0	
Nationality:		
Bahraini	43	28.1
Non-Bahraini	110	71.9
Marital status:		
Unmarried	24	15.7
Married	129	84.3
Nursing qualification:		
Diploma	63	41.2
Bachelor degree	90	58.8
Experience years:		
<5	33	21.6
5-	53	34.6
10+	67	43.8
Range	<1-35	
Mean±SD	9.4±6.1	
Median	8.0	
Had training in cardiac care nursing:	68	44.4

Table 2: Scores of knowledge of physical examination among participants in the study sample (n=153)

Knowledge of physical assessment (scores: max=100)	Scores						
	Mean	SD	Min	Max	Median	Quartiles	
						1st	3rd
Inspection	73.14	22.17	0.00	100.00	80.00	55.00	90.00
Palpation	66.01	24.27	0.00	100.00	75.00	50.00	75.00
Auscultation	68.95	28.25	0.00	100.00	75.00	50.00	100.00
Total knowledge	70.62	19.49	0.00	100.00	72.22	55.56	88.89

Table 3: Relations between nurses' total scores of knowledge of physical examination and their characteristics

	Mean	SD	Median		Mann-Whitney Test	p-value	
Units:							
Hospital (A)	73.44	20.11	77.80				
Hospital (B)	66.48	17.90	63.90		7.15	0.008*	
Sub-units:							
Ward 1 (A)	68.45	24.39	77.80				
Ward 2 (A)	71.84	21.87	72.20		H=13.86	0.008*	
Ward 3 (A)	79.12	12.02	83.30				
Ward 1 (B)	70.30	20.02	66.65				
Ward 2 (B)	62.40	14.57	63.90				
Gender:							
Male	75.39	19.92	83.30				
Female	69.86	19.39	72.20		1.73	0.19	
Age:							
<30	66.39	20.49	66.70				
30-	72.35	19.14	72.20		H=2.81	0.25	
40+	71.82	18.71	72.20				
Nationality:							
Bahraini	63.04	18.57	61.10				
Non-Bahraini	73.58	19.11	77.80		11.44	0.001*	
Marital status:							
Unmarried	73.37	15.71	75.00				
Married	70.10	20.12	72.20		0.24	0.62	
Nursing qualification:							
Diploma	73.10	16.70	72.20				
Bachelor degree	68.88	21.14	72.20		0.90	0.34	
Experience years:							
<5	69.86	19.73	66.70				
5-	71.68	20.30	77.80		H=0.56	0.75	
10+	70.14	18.97	72.20				
Had training in cardiac care nursing:							
No	71.82	20.90	77.80				
Yes	69.11	17.60	72.20			1.91	0.17

(*) Statistically significant at p<0.05 (H) Kruskal-Wallis test

Table 4: Best fitting multiple linear regression model for the examination knowledge score

	Unstandardized Coefficients		Standardized Coefficients	t-test	p-value	95% Confidence Interval for B	
	B	Std. Error				Lower	Upper
Constant	52.51	6.06		8.666	<0.001	40.54	64.48
Non-Bahraini nationality	10.53	3.41	0.24	3.089	0.002	3.79	17.27

r-square=0.053 Model ANOVA: F=9. 415, p=0.002
Variables entered and excluded: age, qualification, marital status, experience, units, subunits, and training courses.

DISCUSSION

The present study findings indicate that the nurses in the study settings have average knowledge of the physical examination of a patient with heart failure. The study sample have some characteristics that were similar to those reported in European [21]and North American [22]nurses providing care to cardiac patients. Thus, in both studies, as in the current one, a majority of the nurses are females. However, they differ in the level of education, where the highest nursing qualification was the bachelor degree, compared with a majority who was carrying master or doctoral degrees in nursing in the other two studies. Moreover, the mean experience years in our study is less than half of that reported in the North American study. These lower level qualification and shorter experience years may explain the low levels of knowledge among the nurses in the present study. Added to this is the lack of training courses, where less than a half of them had attended specialized training courses during their work.

According to the present study findings, approximately three-fourth of the nurses are non-Bahraini. This is a common finding in the Gulf countries, which depend largely on multi-national healthcare work force, especially in nursing. Nonetheless, with the increasing numbers of Bahraini students enrolling in university degree nursing programs, the situation has been gradually changing recently. Thus, Bahraini nurses are often less experienced and could have lower nursing qualification, which may explain the finding that the non-Bahraini nationality is the only independent factor positively influencing the score of nurses' knowledge in our study.

The present study results demonstrate high levels of nurses' knowledge of observing weakness and fatigue, in addition to anxiety in both side heart failure when performing inspection during physical examination of the patient with heart failure. The finding reflects the importance of these symptoms in chronic heart failure as outlined in previous studies [23; 24]. Even more, the anxiety and stress symptoms could have a negative impact on the course and prognosis of heart failure [23]. Conversely, the nurses in the present study have lower knowledge of the importance of observing for dyspnea, breathlessness and orthopnea, as well as for sacral edema in bedridden patients with right side heart failure during physical assessment of the patient. This finding is of concern since dyspnea is an important landmark in the diagnosis of right side heart failure as mentioned by *King et al* [25]. Similarly, missing inspection for sacral edema could have negative consequences on the nursing diagnosis and management. Thus, *Delmas*[26] emphasized that the nurse should be able to identify the presence of edema, and to assess its type, extent, and location. This is of special importance in bedridden patients with heart failure [27]. However, since it needs turning the patient in bed, which could be difficult for the patients and/or the nurse.

Concerning nurses' knowledge of palpation during physical assessment of the patient with chronic HF, the present study point to better knowledge of examination of the liver for enlargement and tenderness in comparison with palpation for ascites. This could be attributed to that the process of liver palpation might be easier than that of ascites. Nevertheless, both are of importance in the diagnosis of chronic heart failure, and could help in the determination of its stage of compensation as highlighted by *Verbrugge et al* [28]in their study in Belgium.

The present study findings also demonstrate a variation in nurses' knowledge of the auscultation part of the physical assessment of the patient with heart failure. Thus, while a majority of them has correct knowledge of the presence of tachypnea in heart failure, only slightly more than half of them have correct knowledge of crackles and rales in HF. In this respect, a multicenter European study demonstrated the prognostic value of the change in heart rate among patients with chronic HF [29]. However, rales are also very important prognostic findings in patients with chronic HF as revealed by a study in Canada where the presence of rales was shown as an independent predictor of cardiovascular *mortality* [30]. Nonetheless, a study in Mayo clinic demonstrated major deficiency in health professionals' auscultatory skills regardless their categories or training [31]. This was also reported among nurses in Canada [32].

Overall, the nurses' scores of knowledge of physical assessment are relatively low, which is in agreement with the results of a recent study among Italian nurses [33]. Although the bivariate analyses in the current study indicate significant differences in nurses' knowledge according to the work units and sub-units, in addition to their nationality, only this latter persisted in multivariate analysis. Hence, the Bahraini nurses seem to be less knowledgeable of the physical examination of the patient with heart failure compared with their non-Bahraini counterparts. This difference has been previously discussed. However, this factor only explains about 5% of the variation in

the knowledge score, which means that other important factors have to be identified and addressed in order to improve these nurses' knowledge.

CONCLUSION AND RECOMMENDATIONS

In conclusion, the nurses in the study settings, particularly the Bahraini nurses, lack sufficient knowledge for proper physical assessment of the patients with heart failure. Hence, specialized training courses are recommended for these nurses, especially for the Bahraini ones. These courses should address the knowledge gaps identified to be effective.

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