Journal Homepage: - www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI: 10.21474/IJAR01/12809
DOI URL: http://dx.doi.org/10.21474/IJAR01/12809

ISSN NO. 2320-5407

RESEARCH ARTICLE

OBSTACLES ENCOUNTERED WHILE DEALING WITH EMERGENCY CASES BY PRIMARY HEALTH CARE PHYSICIANS IN CLUSTER 1 RIYADH CITY, KINGDOM OF SAUDI ARABIA

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Manuscript Info

Manuscript History
Received: 05 March 2021
Final Accepted: 09 April 2021
Published: May 2021

Abstract

Background: The frontline primary healthcare centers (PHCCs) are regularly visited for different medical problems, ranging from minor situation to emergency cases. The frontline primary healthcare centers (PHCCs) are regularly visited for different medical problems, ranging from minor situation to emergency cases. Therefore, analytical cross-sectional study was conducted to assess nature of encountered acute medical emergencies, self-perception and competencies of PCH physicians dealing with them, and, sufficiency of the required PHCCs equipment in hospitals of Riyadh.

Methodology: This cross-sectional study enrolled all the physicians in governmental PHCCs, Ministry of Health (cluster 1) Riyadh city during the study period. The study was conducted using modified previously validated online accessible questionnaire. Online questionnaire was distributed across the selected Primary health care centers in Riyadh by submitting it to PHC manager to distribute to all PHC physicians during study period

Results: In this study, we were able to collect 206 responses for our questionnaire among primary healthcare physicians. Among these physicians 58.8 % were aged between 25-35 years old and 55.3 % were females. We found that the percentage of PHC physicians who will attempt to perform the assessed skills for all patients did not exceed 30%. The least cases seen by physicians were cardiac arrest, acute GIT bleeding, anaphylaxis and acute vaginal bleeding which never seen during the last year by 83.1 %, 72.8 %, 70.9 % and 68 % of participants respectively.

Conclusion: The current study showed that emergency services at the PHC level in Riyadh, Saudi Arabia are not functioning reasonably in some terms. Therefore, the services need to be perfected, and defects revealed by the current study should be taken into consideration hand-in-hand with available resources to upgrade the quality of the emergency services provided at PHC centers in Riyadh.

Introduction:-

Being on the first line in the healthcare system, physicians at primary health-care centers (PHCCs) meet a wide range of cases in all aspects of patients' care from simple daily encounters to emergency cases requiring immediate

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intervention. This wide variety of cases makes it difficult for physicians to cope with; knowledge- and skill-wise. The emergency cases are defined as urgent life-threatening and non-urgent acute cases managed totally or partially at PHCCs. Health emergency has become the major area of concern for the physicians at PHCCs. The World Health Organization defines primary health care as an indispensable health care based on efficient, scientifically sound, and ethically approved methods with regards to the welfare of mankind [1].

In their day-to-day profession, physicians working in the primary health care (PHC) zshock, and cardiac arrest are among the most common medical emergencies in PHCCs. This wide variation of encountered emergency cases poses a challenge for physicians to be properly updated and competent in emergency medicine [2].

Barriers facing primary health care physicians when dealing with emergency cases in KSA are multiples. Describing those barriers as detailed by healthcare service providers, especially physicians, is very important to healthcare policy-makers for effective and optimal current services and setting plans of improvement [3].

Not all PHCCs are fully equipped to handle a medical emergency. Therefore, all PHCCs should have a written emergency protocol that guides them through the emergency case. PHCCs can effectively manage emergency cases by having the correct equipment, education, and protocols [4, 5]. It was found that even if the medical equipment and materials are available in an emergency unit, these skills are rarely implemented because the physician or the supportive practitioners never had a chance to practice on a real case. Many physicians will never have taken the responsibility for directing the care or acting in the lead clinician role during the emergency [6]. Appropriate medical equipments are needed during emergency care for specific cases. For example, a good functioning ultrasound and well-trained gynecologist are required for emergency per vaginal bleeding cases. Cases with cardiac arrest necessitate the presence of essential equipment such as crash cart, ECG machine, monitor, defibrillator, intubation equipment, pulse oximetry, and resuscitation drugs. As for fractures, many prerequisites are needed, like, X-ray machines, cast, splint, and trained personnel. Equipment shortage is the most common factor acting as a barrier in PHCCs [7].

A few numbers of regional studies [3, 8-11] conducted in Saudi Arabia reported a significant rate of emergencies, and, significant deficiencies in equipments (drugs and supporting facilities) and competencies of PHC physicians to deal with acute emergencies. The latter improve with previous experience and training that prevailed among non-Saudi physicians. The deficiency in equipments affected the satisfaction rate of the physicians [3, 8-11]. Internationally, many such studies point to similar deficiencies [12-15].

There is a carecity of data in this regard in Saudi Arabia. Therefore, this analytical cross-sectional study was planned to assess the nature of encountered acute medical emergencies, self-perception and competencies of PHC physicians dealing with them, and, sufficiency of the required PHCCs equipments and drugs.

Methodology:-

This was a cross-sectional survey study that has been conducted among PHC physicians in governmental PHCCs, Ministry of Health, Riyadh, Saudi Arabia, during the period of the study. The study would include all PHC physicians from the selected PHCCs in Riyadh who are voluntarily willing to anonymously participate in this study. Non-physician specialties, absentees and those who did not sign the informed consent of participation were excluded from the study.

The data collection tool for the current study was a validated online accessible questionnaire that has been used in a previously published local study after modification and validation [16]. The questionnaire consists of 7 sections that that address the followings: physicians' socio-demographic data, questions to identify level of the physician's training, previous experience and emergency courses, questions to determine self-perceived competence when dealing with emergency cases, basic equipment availability, infrastructure/services, medications availability, and patients referral.

The questionnaire was sent electronically to the PHC managers in Riyadh, Saudi Arabia, to distribute it to all PHC physicians at their centers. PHC physicians at the targeted PHCCs received an invitation to participate; the invitation contains an explanation of the aims and objectives of the study, and that participation is voluntary, and data will be kept confidentially, anonymously, and will be used for research purposes only. Once the physician accepted to participate, he/she was asked to sign the consent form, after which, he/she was directed automatically to fill the

questionnaire.

Table 1:- Socio-demographic charistrestics of the participants.

		Count	Column N %
Age	25-35	120	58.8%
	36-45	47	23.0%
	46-55	29	14.2%
	56 and more	8	3.9%
Gender	Male	92	44.7%
	Female	114	55.3%
Nationality	Saudi	120	60.3%
	Non Saudi	79	39.7%
Degree of qualification	MBBS	144	71.6%
	ABFM	5	2.5%
	SBFM	17	8.5%
	FM Diploma.	9	4.5%
	consultantFM	10	5.0%
	Other	16	8.0%
Attend life support course	<1 year ago	123	59.7%
	1-2 years ago.	61	29.6%
	>2 years ago.	20	9.7%
	did not attend at all.	2	1.0%
Attend Advanced Cardiac Life Support	<1 year ago	27	13.6%
	1-2 years ago.	25	12.6%
	>2 years ago.	60	30.3%
	did not attend at all.	86	43.4%
Attend Advanced Trauma Life Support	<1 year ago	11	5.5%
	1-2 years ago.	9	4.5%
	>2 years ago.	21	10.5%
	did not attend at all.	159	79.5%
Having work experience in emergency department	Yes	150	73.5%
	No	54	26.5%
Years of work in PHC	<1 year.	52	25.0%
	1-5 years.	81	38.9%
	>5 years	75	36.1%

Statistical analysis:
Data were analyzed by using the Statistical Package for Social Studies (SPSS 22; IBM Corp., New York, NY, USA). Continuous variables were expressed as median and categorical variables were expressed as percentages. Mann-Whitney test and Kruskal-Wallis test were used. A p-value <0.05 was considered statistically significant.

Results:-

In this study, we were able to collect 206 responses for our questionnaire among primary healthcare physicians. Among these physicians 58.8 % were aged between 25-35 years old and 55.3 % were females. Moreover, 60.3 % of participants indicated that they were Saudi Arabian and 71.6 % reported having degree of MBBS. Considering attending different courses, we found that 59.7 % of them reported attending life support course in the last year while 43.4 % did not attend advanced cardiac life support and 79.5 % did not attend advanced trauma life support courses. Moreover, 73.5 % of participants indicated having work experience in emergency department and 38.9 % of them indicated having experience in PHC for a period between 1 – 5 years (Table 1).

Considering the perceived level of competence in performing emergency skills among the primary healthcare physicians, we found that the percentage of PHC physicians who will attempt to perform the assessed skills for all

patients did not exceed 30%. Moreover, the results showed that intubation, defibrillation and inserting IV cannula were the mian missed emergency skills where 36.3 % of participants did not know how to start intubation, 21 % defibrillation, 11.7 % inserting IV cannula. On the other hand, the most popular emergency skills were nebulization oxygen therapy, simple suture, using IV fluid medication and CPR (Figure 1).

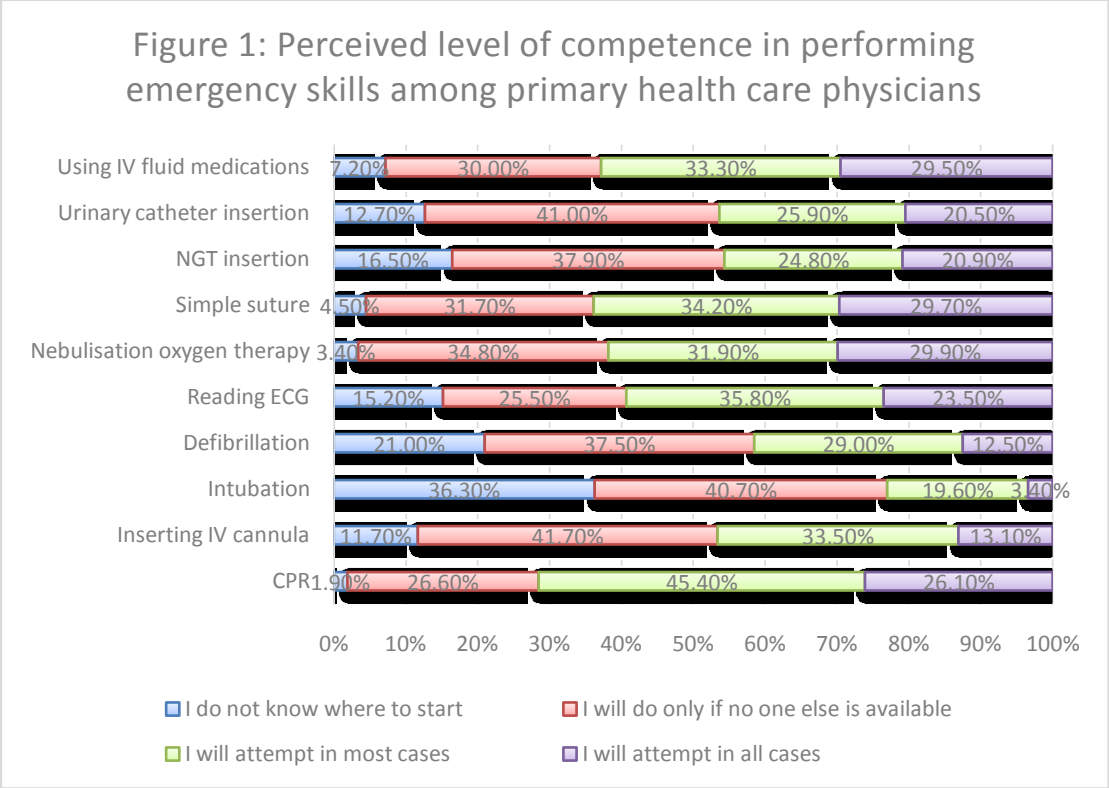


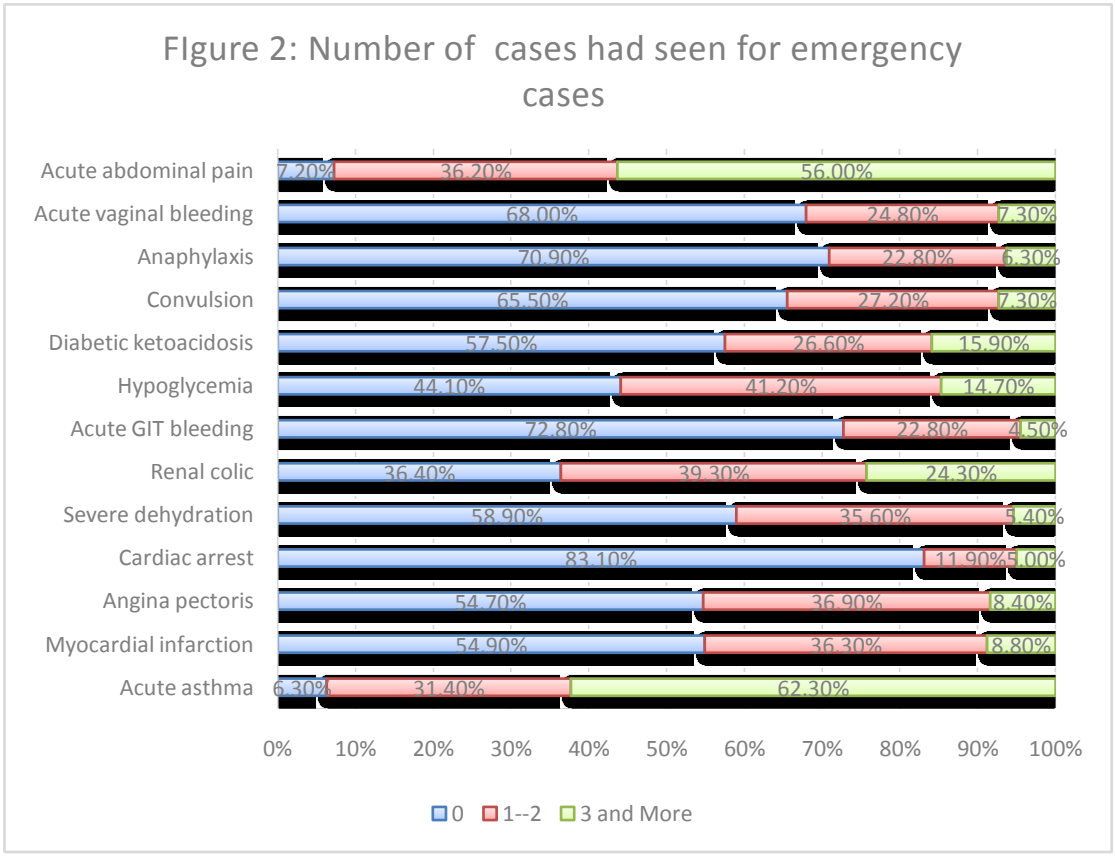
Table (2) shows the factors associated with a perceived level of competence in performing emergency scale skills among PHC physicians. For gender, the association with the score of perceived level of competence in performing emergency scales skill was significantly (P 0.003) higher among males compared to females with a mean score of 117.41 vs. 92.28, respectively. Similarly, having work experience in the emergency department and long duration (>5 years) of working in PHC, as well as attending life support courses, were significantly (P<0.05) associated with higher scores of perceived level of competence in performing emergency scale skills. On the other hand, nationality, qualification degree, attending advanced cardiac life support, and attending advanced trauma life support didn't show significant association with the perceived level of competence in performing emergency scale skills. Differently, there was a borderline statistically significant (P 0.051) association between the score of perceived level of competence in performing emergency scale skill and age, being the highest among the eldest age group (≥56 years) with a mean score of 125.63, followed by those aged 36-45 years with a mean score of 120.24.

Table 2:- Factors associated with perceived level of competence in performing emergency scale skill among PHC physicians.

		Score of level of competence in performing emergency scale skill (10-40)		
		Median	Mean rank	P value
Age	25-35	25.00	94.43	0.051
	36-45	27.00	120.24	
	46-55	24.00	100.74	
	56 and more	27.50	125.63	
Gender	Male	27.00	117.41	0.003*

	Female	24.00	92.28	
Nationality	Saudi	25.00	98.38	0.623
	Non-Saudi	26.00	102.47	
Degree of qualification	MBBS	25.00	96.43	0.227
	ABFM	22.00	91.80	
	SBFM	30.00	131.15	
	FM Diploma.	26.00	96.56	
	Consultant FM	27.00	121.50	
	Other	22.00	102.63	
Attend life support course	<1 year ago	26.00	103.42	0.047*
	1-2 years ago.	27.00	113.67	
	>2 years ago.	23.50	80.48	
	did not attend at all.	15.50	28.50	
Attend Advanced Cardiac Life Support	<1 year ago	27.00	101.31	0.063
	1-2 years ago.	26.00	110.74	
	>2 years ago.	27.00	111.20	
	did not attend at all.	23.50	87.50	
Attend Advanced Trauma Life Support	<1 year ago	26.00	96.50	0.478
	1-2 years ago.	28.00	123.94	
	>2 years ago.	27.00	110.83	
	did not attend at all.	25.00	98.08	
Having work experience in emergency department	Yes	26.00	107.92	0.028*
	No	22.00	87.44	
Years of work in PHC	<1 year.	25.00	104.93	0.024*
	1-5 years.	24.00	91.73	
	>5 years	27.00	117.99	
* Significant p value				

According to figure 2, we found that the least cases seen by physicians were cardiac arrest, acute GIT bleeding, anaphylaxis and acute vaginal bleeding which never seen during the last year by 83.1 %, 72.8 %, 70.9 % and 68 % of participants respectively. On the other hand, the most popular cases were acute asthma (62.3 %), acute abdominal pain (56 %) and renal colic (24.3 %).



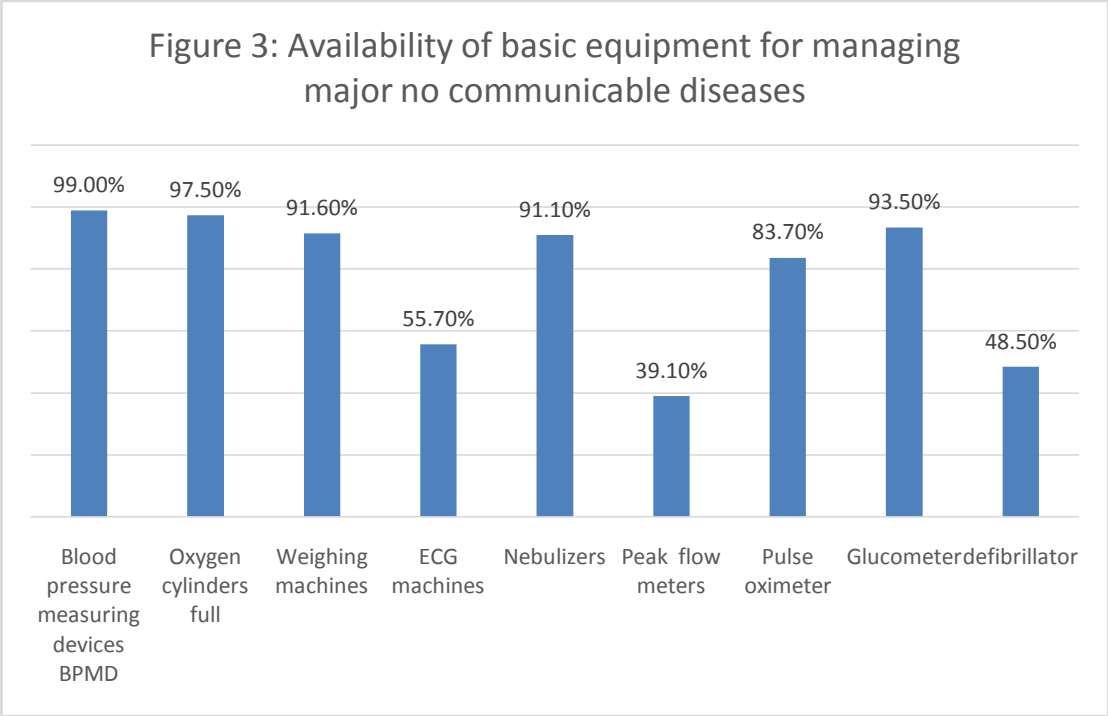
The satisfaction of the PHC physicians with the emergency services provided at the PHC center is shown in table (3). The results revealed that the highest rate of satisfaction with all emergency services provided (facilities, equipment, and trained healthcare personnel) at PHC center were reported in dealing with acute asthma (41.9%), followed by renal colic (35%) and hypoglycemia (33.5%), while the lowest rates were reported in dealing with cases of myocardial infarction(8.9%), angina pectoris (13.5%), cardiac arrest (14%), diabetic ketoacidosis (14.9%), acute GIT bleeding(15.4%), convulsions (16.7%), and acute vaginal bleeding (16.9%). In contrast, the highest rate of overall dissatisfaction about the emergency services provided at the PHC center was reported in dealing with cardiac arrest (37.3%), myocardial infarction (31.5%), acute GIT bleeding (27.7%), and angina pectoris (26.5%). For dissatisfaction with trained personnel, the highest was for anaphylaxis at 28.6%, while for medication deficiency, it was the highest when dealing with cases with convulsions at 37.4%. for facilities and equipment deficiency, it was generally low, being the highest for angina pectoris and myocardial infarction at 15% and 14.8%, respectively.

Table 3:- Satisfaction of the PHC physicians with the emergency services provided at PHC center.

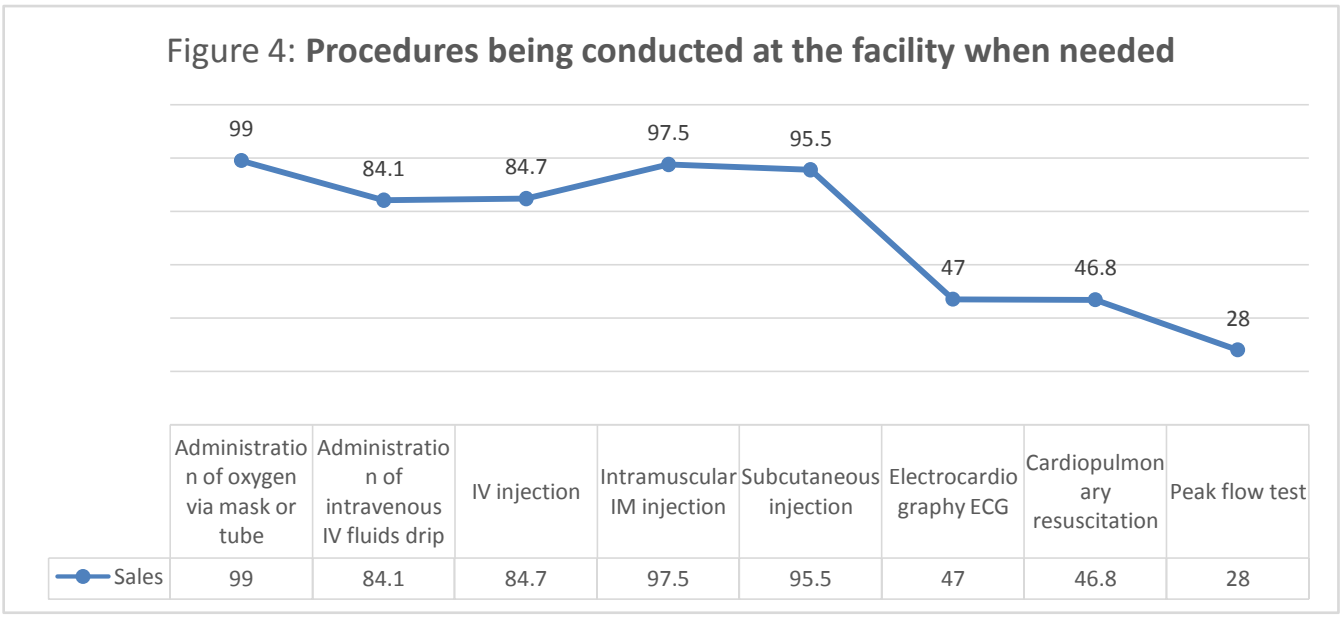
	Satisfaction with the emergency services provided at PHC center									
Emergency Conditions	**1**		2		3		4		5	
	Number	%	Number	%	Number	%	Number	%	Number	%
Acute asthma	83	41.9	46	23.2	45	22.7	11	5.6	13	6.6
Myocardial infarction	18	8.9	40	19.7	51	25.1	30	14.8	64	31.5
Angina pectoris	27	13.5	53	26.5	37	18.5	30	15.0	53	26.5
Cardiac arrest	27	14.0	35	18.1	33	17.1	26	13.5	72	37.3
Severe dehydration	61	30.7	47	23.6	44	22.1	23	11.6	24	12.1
Renal colic	70	35.0	37	18.5	51	25.5	19	9.5	23	11.5
Acute GIT bleeding	30	15.4	40	20.5	49	25.1	22	11.3	54	27.7
Hypoglycemia	67	33.5	45	22.5	41	20.5	20	10.0	27	13.5
Diabetic ketoacidosis	30	14.9	54	26.9	57	28.4	18	9.0	42	20.9
Convulsion	34	16.7	35	17.2	76	37.4	18	8.9	40	19.7
Anaphylaxis	45	22.2	58	28.6	55	27.1	21	10.3	24	11.8
Acute vaginal bleeding	34	16.9	40	19.9	62	30.8	17	8.5	48	23.9
Acute abdominal pain	61	30.0	49	24.1	49	24.1	20	9.9	24	11.8

1- I am satisfied about the facilities, equipment's, trained health care personnel
2- I am satisfied about the facilities, equipment's, and medications but we need more training
3- I am satisfied about the facilities, equipment's but medications are deficient when dealing with such cases
4- I am satisfied about the medications and trained personnel but facilities and equipment's are deficient
5- I am overall not satisfied about the services provided at our PHC center when dealing with such cases

The most available equipments for managing major non-communicable diseases as reported by participants were blood pressure monitoring devices, full oxygen cylinders, weighting machines, glucometers, and nebulizers with availability of more than 90 %. On the other hand, the least available equipments include; peak flow meters (39.1 %), defibrillator (48.5 %) and ECG machins (55.7 %) Figure 3.



The results of the current study revealed that the rates of providing peak flow test, cardiopulmonary resuscitation, and electrographic ECG at the PHC when needed are low at 28%, 46.8%, and 47%, respectively, as shown in (Figure 4).



There are some medications that should be always available for emergency, according to healthcare physicians, beclomethasone inhaler, insulin and isosorbide dinitrite and ibuprofen were the most reported not available medications by 28.5 %, 26.6 %, 26.6 % and 23.2 % of participants. On the other hand, the most available medications according to participants were paracetamol and hydrocortisone at 96.1%, and 73.5%, respectively.

Most (74.6%) of the participated PHC physicians reported that they always have the availability to refer patients to another facility, and private cars followed by ambulances are the most frequent transportation means. Only 14.1% reported that their facility has an ambulance, while 74.6% of the facilities they refer to have an ambulance. From the participate PHC physicians, 13.7% reported that they ever wanted, as shown in table (4).

Table 4:- Referral of patients according to healthcare physicians.

		Number	%
Can you refer patients another facility	Always available	153	74.6
	Sometimes available	20	9.8
	Not available at all	32	15.6
How many kilometers kms from facility	Minutes	88	42.9
	Hours	3	1.5
	Kilometers	12	5.9
	Don't know	102	49.8
Have you ever wanted	Yes	28	13.7
	No	177	86.3
Does your facility ambulance	Yes	29	14.1
	No	154	74.8
	I do not know	23	11.2
If the facility does ambulance	Yes	153	74.6
	No	20	9.8
	I do not know	32	15.6
What means transport most frequently	Ambulance	88	42.9
	Public transport	3	1.5
	Commercial vehicle (e.g. taxi)	12	5.9
	Private vehicle	94	45.9
	Other	8	3.9

Discussion:-

Several studies have shown that in an active primary health care center, emergencies should be always expected [17, 18]. An emergency is defined as "a sudden incident that necessitates immediate and appropriate management to treat its consequences and avoid its sequelae" [19]. The results of the current study highlighted that most of the participated primary health care physicians are not attempt to perform emergency skills in all cases and that they were mildly satisfied with the emergency services provided at their assigned PHCCs. Besides, the current study quantifies the average number and types of emergencies seen in PHCCs centers in Riyadh, Saudi Arabia, allowing the medical authorities to grasp the importance of improving the preparedness of these centers for emergencies.

Overall, the attempt to perform the emergency skills for all patients in the current study did not exceed 30%, being the highest for simple suture, a percentage which is lower than a previous local study from Jeddah, Saudi Arabia at 44% for simple suture [20]. For the gender and its correlation with the score of perceived level of competence in performing emergency skills, Aloufi MA and Bakarman MA found no significant difference between the two genders, while in our case, the score was significantly higher among males [20]. Similarly, age and nationality were not associated with the perceived level of competence in performing emergency skills in the current study, but they were in the previous one [20].

In the current study, more than 62.3% of the PHC physicians have seen more than three cases of acute bronchial asthma in the last 12 months; a percentage that is higher than what was reported in a previous similar study at 70% [20]. In contrast, a significantly lower percentage of physicians reported seeing three or more cases of renal colic in the current study at 24.35 vs. 39.3% in the previous study [20]. While, in line with this previous study [20], the

current study revealed that the highest percentage of the participants did not see any cases was for acute GIT bleeding and cardiac arrest at 80.6% and 83.1%, respectively. In the Dammam area, Saudi Arabia, bronchial asthma, cut wounds, burns, acute abdomen, and palpitation represent the most common cases encountered [21]. In 2007, the American Academy of Family Physicians conducted a review of numerous articles and concluded that asthma, anaphylaxis, shock, seizures, and cardiac arrest are the most common adult and pediatric emergencies seen in primary care settings, [22- 25]. Such findings highlight the wide range of emergency cases encountered in various communities where demographic, cultural, and geographic factors all play a role. In Australia, a study conducted in a rural area showed that the general practitioners see a median of 8 emergency cases per year and that 95 % had seen at least one emergency in the preceding 12 months [26]. Ablah, E et al [27] study found that 62 % of family medicine and child care offices saw one or more children who required hospitalization or urgent treatment each week.

Most of the current study participants have their qualifications as MBBS, and the score of perceived level of competence in performing emergency skills wasn't significantly associated with the physicians' qualification. This is in contrast with a previous similar study [20]. Previous studies in Saudi Arabia showed that the majority of PHC physicians would like to acquire more knowledge and skills related to emergency medicine [28]

Updated physicians' knowledge, communication, and procedural skills along with the presence of trained paramedical staff are vital to providing optimum care which might save lives. The wide range of emergencies and the rarity of some of them make it difficult for physicians to be updated and competent in emergency care provision [29].

As with any study, the current study has its limitations including the small sample size and that it was restricted only to the Riyadh region, which might limit generalizing the results to the whole kingdom. Though, this is the first study conducted in Riyadh city, the capital of Saudi Arabia. Besides, it is an important study since it provides information regarding PHC physicians perceived level of competence in performing emergency skills.

Conclusion:-

The current study showed that emergency services at the PHC level in Riyadh, Saudi Arabia are not functioning reasonably in some terms. Therefore, the services need to be perfected, and defects revealed by the current study should be taken into consideration hand-in-hand with available resources to upgrade the quality of the emergency services provided at PHC centers in Riyadh. Male gender, more experienced physicians, and those having more years in PHC showed a higher perceived level of competence in performing the emergency skill.

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