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ORIGINAL RESEARCH

Evaluation of Communicable Diseases Surveillance System Structure in Mosul City

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ABSTRACT

Background: One of the most important global public health issues and it is a major source of death for many people around the world. Illnesses caused by infection invasion of the body with specific germs such as viruses, bacteria, funguses, and parasites.
Objectives: Evaluating communicable diseases surveillance system structure at Mosul City.
Methodology: A descriptive study using an evaluation approach is conducted to evaluate the Communicable Diseases Surveillance System Structure in Mosul City from April 20th 2022 to May 21th 2023. A non-probability multistage sample was adopted of the study, as twenty-three (23) health institutions are chosen and interview is conducted with health staff works in the communicable diseases Surveillance System. Developed evaluation tool (Questionnaire) used to collect the data according to WHO framework (Generic Questionnaire) for monitoring and evaluating surveillance and response system for communicable disease.
Results: The outcomes indicate that the most of system's organizational structure component are effective, available and sufficient to implement such system for the benefit of consumers from communicable diseases services' in relation to patient surveillance manual, personnel, resources and supplies and training. However, the study findings showed that Public Health Department, both healthcare sectors and hospitals, in Mosul City, have much better organizational structure of Communicable Diseases Surveillance System than Main and Family Medicine Primary Healthcare Centers.
Conclusion: All hospitals, in Mosul City, have presented an experimental evidence that their organizational structure of the Communicable Diseases Surveillance System is well competent to implement it.

Keywords: Evaluation, Surveillance System, Communicable Diseases.

INTRODUCTION

Communicable Diseases are illnesses caused by infection (invasion of the body) with specific germs such as viruses, bacteria, funguses, and parasites are called infectious diseases (Faraj & Khalifa, 2014; Rasheed & Qassim, 2021), and can be spread from one person, animal, or inanimate source to another either directly or indirectly (Yousef et al., 2021; HUSSEIN & FRAAJ, 2021). Throughout the eras, communicable diseases are one of the most important global public health issues and it is a major source of death for many people around the world (World Medical Association, 2022).

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Whereas the Surveillance is ongoing monitoring, gathering, analysis, and interpretation of data on the program (inputs, activities, outputs, and outcomes). The primary purpose of monitoring data is to enable program managers to assess the performance of programs for program improvement (Ali & Qassim, 2021).

Because of effective control of infectious diseases depends on effective response systems which needs an effective disease surveillance system that provides information to act on priority communicable diseases (Al- Ziyara et al., 2021) So, the Surveillance considers a fundamental component of the strategy against emergence of infection (Hummed & Khalifa, 2005). But, the adequacy of the existing system to fulfill surveillance and response needs should be reviewed (Hadi & Khalifa, 2014).

Therefore, Surveillance of infectious diseases is recognized as the cornerstone of public health decision- making and practice (Lefta & Khalifa, 2016) Surveillance System has been around a long time (Musa & Kalifa, 2012)., So, about the middle of the twentieth century when infectious diseases were a big problem and threat to public health, these systems have existed since 1963 by Alexander Langmuir (Chow & Leo, 2017).

Due to evaluation is an important part of infectious disease surveillance. The systematic and objective evaluation of monitoring determines the appropriateness, effectiveness and impact of these system (Al- Ziyara et al., 2021). Hence, the systems must be evaluated periodically and continuously to ensure their efficiently and effectively (Kalil et al., 2021). The evaluation of these systems depend on Donabedian model has been used as a framework for health care quality since 1966. The model describes structure, process, and outcome measures (Binder et al., 2021).

WHO framework for monitoring and evaluating surveillance and response systems for communicable diseases commonly used for purpose of guiding the evaluation process of public health surveillance systems; and it can identify the major element of evaluation process; which are used in evaluation of communicable diseases surveillance system structure (Baktash & Abdul Wahid, 2016).

A study has been conducted in most of countries showing the weakness of organizational structures and their direct impact on the surveillance system (Janati et al., 2015; Kadhim AJ). But unfortunately there are no studies showing the efficiency of Surveillance Systems in Iraq except some regions. During the previous periods, Mosul city suffered from security instability, which led to the deterioration of many public health programs, including epidemiological surveillance programs.

AIMS OF THE STUDY

This study aims to ensure the efficiency of Mosul's Communicable Diseases Surveillance System.

METHODOLOGY

A descriptive study using an evaluation approach is conducted to evaluate the Communicable Diseases Surveillance System Structure at Hospitals, Primary Health Care Centers, Health Care Sectors and Health Directorate in Mosul City from April 20th 2022 to May 21th 2023.

The study is conducted in Iraq, (Nineveh governorate), and carried out in this Health Directorate and it is two sectors (Left sector and Right sector) as well as it is related four (4) Hospitals with sixteen (16) Primary Health Care Centers with selected purposively from both sides of Mosul.

The necessary written official approvals for conducting the study are obtained from Ministry of Planning Central Statistical System and Ministry of Health Center of Training and Staff Development. In addition to other consents are also obtained from Mosul Health Directorate in addition, the following health care sectors.

(1) Right Health Care Sector in Mosul.
(2) Left Health Care Sector in Mosul.

(3) Hospitals

A multistage sample of (23) health institutions, under surveillance are visited, which are selected throughout the use of non-probability sampling approach chosen and interview is conducted with health staff works in the communicable diseases Surveillance System. The sample of study is divided into three stages which include; First stage: health directorates, Second stage: health sectors, Third stage: primary health centers and hospitals.

An evaluation tools (Questionnaire) developed depending on WHO framework (Generic Questionnaire) for monitoring and evaluating surveillance and response system for communicable disease; with some modifications to be adopted with study. This framework is used to evaluate basic component of the evaluation tool; structure, process and outcome of communicable disease surveillance system.

A pilot study was conducted to determine validity and internal consistency reliability of the study instrument. In order to test the validity of the instrument, the questionnaire is present to (11) experts in different field for this purpose. Internal consistency reliability is employed for the study instrument via the use of split-half technique and the computation of Cronbach alpha correlation coefficient, finding indicates that alpha correlation coefficient is (r= 0.86) reliably adequate for the interview questionnaire.

Data are collected through the use of the study instrument and application of the interview technique is conducted with health staff works in the communicable diseases Surveillance System. Data are analyzed using SPSS program, version (26) by application of the descriptive statistical data analysis approach (frequency, percentage, total score, range and mean of scores).

RESULTS

Table (1) Finding for this table, indicate that the overall evaluation of the organizational structure domain of Communicable Diseases Surveillance System in Mosul City have good level (100%) for the Department Public Health, Left and Right Primary Healthcare Sectors and all hospitals.

Table (2): This table outcome displays that main primary healthcare centers have fair level for patient surveillance manual as sub-domain of organizational structure (75%) more than other sites. Also, Results, present that the mean of scores is high on all items.

Table (3): This table results show that the personnel as sub-domain of organizational structure for public health department, both Primary health sectors and main primary healthcare centers have fair level for (75%) more than other sites. Additionally, findings, revel that the mean of scores is high on most items.

Table (4): Outcomes of this table present that (75%) of main primary healthcare centers have fair level for resources and supplies as sub-domain of organizational structure more than other health institutes. Finding to display that the mean of scores is high on most items.

Table (5): This table outcome shows that training as sub-domain of organizational structure have fair level (75%) for main primary healthcare centers more than other health facilities. Also, finding for this table, indicate that the mean of scores is high on all items.

DISCUSSION:

The Structure evaluation analysis for the communicable diseases Surveillance System shows that some facilities need to be more strengthen and other at adequate performance, and the tables explain it as following:

In regard to overall Evaluation of the Domain of Organizational Structure of Communicable Diseases Surveillance System in Mosul City as displays in (table 1), it's outcomes present that Public Health Department, both Primary Healthcare Sectors and all hospitals, in Mosul City have good level (100%) which

are better than Main and Family Medicine Primary Healthcare Centers, and in my opinion this is can be interpreted as an inadequate structure in regard to patient surveillance manual, personnel, resources and supplies and training. This might be due to indirect connection of the Main and Family Medicine Primary Healthcare Centers with highest health institution in the city and governorate, opposite to, another Health institutions which have direct link with its, subsequently suffering and the shortages in the organizational structure, as well as obtaining all the belongings to provide everything necessary for the structure and its' subdomains; to complete then develop the surveillance system to the fullest to meet the demand and ambition. This study results in the table (1) it corresponds with the study done in Iraq which depict that more than two-thirds of them have experienced adequate structure (75%) and the remaining have inadequate ones (25%) (Handhal, 2018).

Concerning to patient Surveillance Manual, Results in the table (2) indicate that main primary healthcare centers have fair level (75%) more than other health facilities, especially for the item of: (Is the existing surveillance manual updated?). Also, Results, present that the mean of scores is high on all items. In my perspective this can be a result for do not being good in observation because the patient surveillance manual is update yearly and centrally from the ministry of health. table (2) results in this study is correspondent with the study done in Iraq; which mentioned that standard and guidelines were present in most studied areas (seven districts, two pediatric hospitals and fourteen Primary Health Care Centers) at Baghdad-Resafa Director of Health (Asaad, 2013).

In relation to table (3) (Personnel), reveal that main primary healthcare centers have fair level (75%) more than other health institutes. Also, Results, show that the mean of scores is high on most items. This study matches with another study done in Iraq, in all study sites except Health Director, because lack of the system of administrators and supervisors at directorate level, that is accounted for (0%). On the other hand, there is a numerical increase for workers in the system in the rest of the stages (100%) for Primary Health Care Sector and Centers with Hospitals (Baktash & Abdul Wahid, 2016).

Regarding Resources and Supplies as shown on table (4) results, indicate that main primary healthcare centers have fair level (75%) more than other health sites. Also, results, reveal that the mean of scores is high on most items. This study results in the table (4) is not similar to the study done in Iraq which find that majority of the primary Health Care Centers have a poor Level of resources and supplies (Ali and Qassim, 2021).

Relating to Training as explain in the table (5) results, show that main primary healthcare centers have fair level (75%) more than other health institution. Finding of this table too, show that the mean of scores is high over all items. This study results that there is disagreement with another study which demonstrates that only (25.0%) of studied PHCCs have members trained in disease surveillance and epidemic management, which has scored poor level by a proposed evaluation (Al-Ziyara et at., 2021).

CONCLUSIONS:

The study concluded that all hospitals in Mosul City, found an experimental evidence that their structure of the Communicable Diseases Surveillance System is well qualified to implement such system for the benefit of communicable diseases services'. Also, it confirms that all institutions are consider good health care facility for communicable Diseases Surveillance System for the community of Mosul City.

RECOMMENDATIONS:

The study can be recommended to Regular and periodic monitoring, and follow-up can be initiated for the benefits of the Communicable Diseases Surveillance System implementation.

Moreover, it is recommended that the organizational structure of the Communicable Diseases Surveillance System at the primary healthcare centers, in Mosul City, must to be offered with supportive measures to enhance its competence.

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DISCLOSURE STATEMENT:

The authors declare no conflicts of interest.

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AUTHOR'S CONTRIBUTIONS

All authors made substantial contributions to this work, including the development of the research hypothesis, drafting the first manuscript, collecting and analyzing the data, and critically revising the final version of the manuscript.

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TABLES:

Table (1): Overall Evaluation of the Domain of Organizational Structure of Communicable Diseases Surveillance System in Mosul City

list	Range	Type	F	%
1	Good (43.34-52)	Public Health Department	1	100
		Right Healthcare Sector	1	100
		Left Healthcare Sector	1	100
		Main Primary Healthcare Centers	6	75
		Family Medicine Primary Healthcare Centers	7	87.5
		Hospitals	4	100
2	Fair (34.6-43.3)	Public Health Department	0	0
		Right Healthcare Sector	0	0
		Left Healthcare Sector	0	0
		Main Primary Healthcare Centers	2	25
		Family Medicine Primary Healthcare Centers	1	12.5
		Hospitals	0	0
3	Poor (26-34.6)	Public Health Department	0	0
		Right Healthcare Sector	0	0
		Left Healthcare Sector	0	0
		Main Primary Healthcare Centers	0	0
		Family Medicine Primary Healthcare Centers	0	0
		Hospitals	0	0

Table (2): Evaluation and Mean of Scores on Items of Patient Surveillance Manual as Sub-domain of Organizational Structure

Institutions	Items	MS	Eva.	F	%
Public Health Department	Is there national manual for patient surveillance?	2	High	1	100
	Is the existing surveillance manual updated?	2	High	0	0
	Is the existing surveillance manual easy to be applicable?	2	High	0	0
Right Primary Health Care Sector	Is there national manual for patient surveillance?	2	High	2	100
	Is the existing surveillance manual updated?	2	High		
	Is the existing surveillance manual easy to be applicable?	2	High	0	0
Left Primary Health Care Sector	Is there national manual for patient surveillance?	2	High		
	Is the existing surveillance manual updated?	2	High	0	0
	Is the existing surveillance manual easy to be applicable?	2	High		
Main Primary Healthcare Centers	Is there national manual for patient surveillance?	2	High	6	75
	Is the existing surveillance manual updated?	2	High	2	25
	Is the existing surveillance manual easy to be applicable?	2	High	0	0
Family Medicine Primary Healthcare Centers	Is there national manual for patient surveillance?	2	High	7	87.5
	Is the existing surveillance manual updated?	2	High	1	12.5
	Is the existing surveillance manual easy to be applicable?	2	High	0	0
Hospitals	Is there national manual for patient surveillance?	2	High	4	100
	Is the existing surveillance manual updated?	2	High	0	0
	Is the existing surveillance manual easy to be applicable?	2	High	0	0

Eva. = Evaluation, F: Frequency, %: Percent, Scale: (Yes= 2) (No= 1) MS= Mean of Scores, Low= (Mean of Scores < 1.5), Moderate= (Mean of Scores =1.5), High= (Mean of Scores > 1.5) Range= Good (5.1-6), Fair (4.1-5), Poor (3-4).

Table (3): Evaluation and Mean of Scores on Items of Personnel as Sub-domain of Organizational Structure

Institutions	Items	MS	Eva.	Range	F	%
Public Health Department	1	2	High	Good	1	75
	2	1	Low	Fair	0	25
	3	2	High	Poor	0	0
Right Primary Health Care Sector	1	2	High	Good	2	75
	2	2	High			
	3	2	High	Fair	0	25
Left Primary Health Care Sector	1	2	High			
	2	2	High	Poor	0	0
	3	2	High			
Main Primary Healthcare Centers	1	1.25	Low	Good	6	75
	2	1.75	High	Fair	2	25
	3	2	High	Poor	0	0
Family Medicine Primary Healthcare Centers	1	1.37	Low	Good	7	87.5
	2	1.75	High	Fair	1	12.5
	3	2	High	Poor	0	0
Hospitals	1	2	High	Good	4	100
	2	2	High	Fair	0	0
	3	2	High	Poor	0	0

Eva.= Evaluation, F: Frequency, %: Percent, Scale: (Yes= 2) (No= 1) MS= Mean of Scores, Low= (Mean of Scores < 1.5), Moderate= (Mean of Scores =1.5), High= (Mean of Scores > 1.5) Range= Good (5.1-6), Fair (4.1-5), Poor (3-4).

Items

1- Are the staff in the health unit trained "basic" on the patient surveillance and reporting system?
2- Are the staff in the health unit trained developmentally training on the patient surveillance and reporting system?
3- Are the trained staff on the surveillance system, belong to?

Table (4): Evaluation and Mean of Score on Resources and Supplies as Sub-domain of Organizational Structure

items	Public Health Department				Right Primary Health care Sector				Left Primary Health care Sector				Main Primary Healthcare Centers				Family Medicine Primary Healthcare Centers				Hospitals			
	MS	Eva.	F	%	MS	Eva.	F	%	MS	Eva.	F	%	MS	Eva.	F	%	MS	Eva.	F	%	MS	Eva.	F	%
1	2	High	1	100	2	High	1	100	2	High	1	100	2	High	6	75	2	High	7	87.5	2	High	4	100
2	2	High			2	High			2	High			2	High			2	High			2	High		
3	2	High			2	High			2	High			2	High			2	High			2	High		
4	2	High			2	High			2	High			2	High			2	High			2	High		
5	2	High			2	High			2	High			2	High			2	High			2	High		
6	2	High	0	0	2	High	0	0	1	Low	0	0	2	High	2	25	2	High	1	12.5	2	High	0	0
7	2	High			1	Low			2	High			1.37	Low			1.75	High			1.75	High		
8	2	High			2	High			2	High			1	Low			1.13	Low			1.5	Moderate		
9	2	High			2	High			2	High			2	High			2	High			2	High		
10	2	High			2	High			2	High			2	High			2	High			2	High		
11	2	High			2	High			2	High			2	High			2	High			2	High		
12	2	High	0	0	2	High	0	0	2	High	0	0	1	Low	0	0	2	High	0	0	1.5	Moderate	0	0
13	2	High			1	Low			1	Low			1	Low			2	High			2	High		
14	2	High			2	High			2	High			2	High			2	High			2	High		
15	2	High			2	High			2	High			2	High			2	High			2	High		
16	1	Low			2	High			2	High			1	Low			1	Low			1.75	High		
17	2	High			2	High			2	High			2	High			1.75	High			2	High		
			1T	100 T.			1T	100 T.			1T	100 T.			8 T	100 T.			8T	100 T.			4T	100 T.

Good (28.34-34), Fair (22.67-28.33), Poor (17-22.66)

Eva. = Evaluation, F: Frequency, %: Percent, Scale: (Yes= 2) (No= 1) T.= Total MS= Mean of Scores, Low = (Mean of Scores < 1.5), Moderate= (Mean of Scores =1.5), High= (Mean of Scores > 1.5).

Items

1- Is there a communicable disease register at the health institute?
2- Are registers considered as a base for the main data from which the required information is taken, and returned when needed?
3- Is there an immediate notification form in the health institute?
4- Is there a weekly report form in the health institute?
5- Is there a monthly report form in the health institute?
6- Is there an epidemiological investigation form in the health institute?
7- Is there a shortage in the staff working of the surveillance system?
8- Is there a special room for staff working of the surveillance epidemiological cases?
9- Electricity
10- Computer
11- Printer
12- Internet Line

13- Phone
14- Calculator
15- Educational Posters
16- Mode of Transmission
17- Stationery (Pens, Papers)

Table (5): Evaluation and Mean of Score on Training as Sub-domain of Organizational Structure

Institutions	Items	MS	Eva.	Range	F	%
Public Health Department	Surveıllance Responsıble	2	High	Good	1	100
	Data Manager	2	High	Fair	1	0
	Surveıllance Supervısors	2	High	Poor	0	0
Right Primary Health Care Sector	Surveıllance Responsıble	2	High	Good	2	100
	Data Manager	2	High			
	Surveıllance Supervısors	2	High	Fair	0	0
Left Primary Health Care Sector	Surveıllance Responsıble	2	High			
	Data Manager	2	High	Poor	0	0
	Surveıllance Supervısors	2	High			
Main Primary Healthcare Centers	Surveıllance Responsıble	2	High	Good	6	75
	Data Manager	1.87	High	Fair	2	25
	Surveıllance Supervısors	2	High	Poor	0	0
Family Medicine Primary Healthcare Centers	Surveıllance Responsıble	1.87	High	Good	7	87.5
	Data Manager	1.87	High	Fair	1	12.5
	Surveıllance Supervısors	2	High	Poor	0	0
Hospitals	Surveıllance Responsıble	2	High	Good	4	100
	Data Manager	2	High	Fair	0	0
	Surveıllance Supervısors	2	High	Poor	0	0

Eva.= Evaluation, F: Frequency, %: Percent, Scale: (Yes= 2) (No= 1) MS= Mean of Scores, Low= (Mean of Scores < 1.5), Moderate= (Mean of Scores =1.5), High= (Mean of Scores > 1.5) Range= Good (5.1-6), Fair (4.1-5), Poor (3-4).