



Health Educational Program for Patients Suffering from Typhoid and Paratyphoid Fever

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ABSTRACT

Background: Typhoid and paratyphoid fevers is an acute infectious disease with similar clinical features and characterizes by lesion of payer's patches, bacteremia, severe intoxication, enlarged liver and spleen. **Aim:** This study aimed to assess patients' knowledge regarding typhoid and paratyphoid fever in outpatient clinic at El-Minya fever hospital. **Study design:** Descriptive research design was used in this study. **Sample:** purposive sample includes 123 patients diagnosed with typhoid and paratyphoid. **Setting:** Outpatient clinics in El-minya fever hospital. **Tools:** one tools used composed of three parts, interviewing questionnaire include socio-demographic characteristic, past and present history of typhoid and paratyphoid, patient's knowledge about typhoid and paratyphoid fever. **Results:** revealed that 60.2% of the studied subjects were male while, 39.8% of them were female. 74.0% of them lived in rural residence and 61.0% of them from 3 to 5 rooms at their homes. 65.9 % of them suffered from fever. **Conclusion:** The current study concludes that the most of studied sample had unsatisfactory level of knowledge about typhoid and paratyphoid fever disease, the majority of them had low level of quality of life at environmental, physical and psychological status. **Recommendations:** continues health educational programs to all patients in hospitals that would help them to improve their quality of life and general health condition.

Key words: *Typhoid and Paratyphoid fever, Patients Knowledge.*



Introduction

Typhoid and paratyphoid fever are a systemic infection with the bacterium salmonella enteric serotype typhus. This highly adapted human-specific pathogen has evolved remarkable mechanisms for persistence in host that help to ensure its survival and transmission, two diseases are similar, and both called enteric fevers without treatment, about 1 in 5 people with typhoid and paratyphoid fever die (1).

Typhoid and paratyphoid fever are an important cause of illness and death in the overcrowded and unsanitary urban conditions of the United States and Europe in the 19th century. The provision of clean water and good sewage systems lead to a dramatic decrease in the incidence of typhoid in these regions (2).

The incidence of typhoid and paratyphoid fever is estimated to be about 17 million cases worldwide and is highest in those between the ages 5 to 19 years in Southeast Asia, approximately 350,000 deaths occur annually in Asia due to typhoid and paratyphoid fever without treatment (3).

Spread of typhoid and paratyphoid fever in El-Minya governorate related to poor sanitation that is found among poor crowded populations that because the governorate of El-Minya from the most densely populated provinces has reached statistical population, in 2020 with population of 7 million and 210 thousand according to the central agency for mobilization and statistics (4).

Typhoid and paratyphoid fever are transmitted via contaminated food or water. Although typhoid and paratyphoid fever are no longer endemic in the United States, approximately 200 to 300 cases are reported each year, mainly in travelers returning from developing countries, or persons exposed to chronic carriers (5).

Classical symptoms of typhoid and paratyphoid fever include gradual onset of sustained fever, chills, splenomegaly and abdominal pain. In some cases, patients experience rash, nausea, anorexia, diarrhea or constipation, headache (6).

Complications of typhoid and paratyphoid fever often occur in 10 to 15% percent of patients and are particularly likely in patients who have been ill for more than two weeks. There are many complications of typhoid and paratyphoid as gastrointestinal bleeding, intestinal perforation, and typhoid encephalopathy (7).

Prevention of typhoid and paratyphoid fever include public health programmatic use in both endemic and outbreak settings. there are various vaccination strategies using the currently available typhoid



vaccines injectable polysaccharide Vaccine, oral vaccine, and injectable Typhoid Conjugate Vaccine [TCV]. (8)

Community health nurse plays vital role to prevent of typhoid and paratyphoid fever through taking the roles through educate and encouraged community members, to do the following: practice hand washing with soap and running water before food preparation and eating, after using the toilet, handling soiled diapers, bed linen and maintain a high standard of personal hygiene in general, maintain rigorous standards of cleanliness in food preparation and handling of food (9).

Significance of the study

The incidence of typhoid fever varies widely between various sites (annual incidence: 24/100 000 person years in Vietnam, 180/100 000 person years in Indonesia, 494/100 000 patients' years in India). Approximately 420 000 deaths occur annually in Asia due to typhoid and paratyphoid fever without treatment (10).

According to Centers for Disease Control and Prevention (CDC), 2016 "Egypt is among 20 top countries with the highest prevalence of typhoid and paratyphoid fever. According to the International enteric fever Federation, there were 4.182.700 people have salmonella typhoid and paratyphoid fever in Egypt in 2016 (11).

Minya Governorate is considered one of the agricultural governorates with a large quantity of agricultural land on the side of drainage banks, which enhances the spread of the typhoid and Paratyphoid fever on the other hand there are some poor villages that do not have health protection services (12).

Aim of the Study

The aim of this study to Assess patients' knowledge regarding typhoid and paratyphoid fever in outpatient clinic at El-Minya fever hospital.

Research Questions

Q 1 - Do the patients have knowledge about typhoid and paratyphoid fever disease?

Q 2 - Is there a relationship between the quality of life and typhoid fever disease?



Subject and Methods

Design:

A descriptive study was applied to achieve the aim of the current study.

Setting:

This study was conducted in outpatient clinic at El-minya fever hospital. Outpatient clinics in El-minya fever hospital including six clinics, four for adult patients and two for child. In each clinic there had one bed, office for the doctor. One window and sink for hand washing & two nurses and one doctor. One head nurse to all clinics. About 20 patients of typhoid and paratyphoid fever visit the clinics daily. All clinics were opened in the same direction and fulfilled with personnel protective equipment. One room for lab investigation beside the clinics. Two bathrooms are available for all clinics. Clinics are located in the first floor.

Subjects:

The subjects of the existing study were 123 patients in outpatient clinic at El-Minya fever hospital according to the following inclusion criteria; patients diagnosed with typhoid and paratyphoid fever and accept to be participate in the study.

Sampling technique:

Purposive sample used in this study. Total number of patients in one year begin of august 2018 to end of July 2019 is 180 patients according to sample size calculation at 95% and error 5% it was 123 patients in outpatient clinic at El-Minya fever hospital.

Tools of data collection:

Data for this study collected by using the following one tool include: Tool:

An interview questionnaire:

Data for this study collected by using a questionnaire sheet which designed by the researcher after reviewing related literature it included four parts:

Part I: Socio-demographic characteristics of patients consisted of 11 items such as: name, sex, age, marital status, residence, number of family member, room's numbers, crowding index, level of education, occupation and income.



Part III: Patient's Knowledge about typhoid and paratyphoid fever included 14 closed end **questions as:** meaning, causes, mode of transmission, signs and symptoms, risk factors, what done in appear signs and symptoms, medical and non-medical treatment, diagnosis, complication, effect and causes of high-grade fever and prevention of typhoid and paratyphoid.

Scoring system, it included 37 questions; the answer score 2 point for complete correct answer, 1 point for an incomplete correct answer and zero point to wrong answer.

The total score of patient's knowledge about typhoid and paratyphoid fever =74 score which be divided as the following:

- Poor knowledge $\leq 50\%$ (≤ 37 score)
- Average knowledge 50 -70 % (38:52 score)
- Good knowledge $> 70\%$ (≥ 53 score).

Tool validity and Reliability:

A) Validity content:

The revision of the tools for clarity, relevance, comprehensiveness, understanding and applicability was done by a panel of five experts from the community health nursing specialty Helwan and El-Minya universities to measure the content validity of the tools and the necessary modification done accordingly through add some question to assess the patient's knowledge about typhoid and paratyphoid fever. All recommended modifications were applied.

B) Tool Reliability:

Reliability was applied for testing the internal consistency of the tool, by administration of the same tools to the same subjects under similar conditions two times. Answers from the repeated testing were compared (Test- re- test reliability was 0.82 for knowledge) and Cronbach's Alpha reliability was 0.890 for practice.

Ethical consideration:

An official permission to conduct the proposed study obtained from the Scientific Research Ethics Committee. Participation in the study is voluntary and the informed consent. The ethical considerations include explaining the purpose and nature of the study, stating the possibility to withdraw at any time, confidentiality of the information where it was not be accessed by any other party without taking permission of the participants. Ethics, values, culture and beliefs respected. Subjects given complete full information about the study and their role before signing.

**Pilot study:**

The pilot study done on 10% of the sample equal 12 patients to examine the clarity of questions and time needed to complete the study tools. Based on the results, no modification was done. Patients included in the pilot study included from the study because no modifications were done.

Field work:

A written approval letters obtained from the Dean of faculty of nursing, Helwan University for practice the study in the faculty of nursing. Written letter should be sent to the health directorate and director of the El-minya fever hospital for conducting the study including the aim of the study to obtain the permission to visit the hospital and conduct the study, including the aim of the study. A written approval obtained from patient after the researcher introduces her for them and after explaining the purpose of the study.

Statistical Analysis

Upon completion of data collection, data computed and analyzed using Statistical Package for the Social Science (SPSS), version 24 for analysis. The P value set at 0.05. Descriptive statistics tests as numbers, percentage, mean standard deviation (SD), will be used to describe the results. Appropriate inferential statistics such as “F” test or “t” test used as well.

-Degrees of Significance of the results were:

- When $P > 0.05$, it is statistically insignificant difference.
- When $P < 0.05$, it is statistically significant difference.
- When $P < 0.01$ or $P < 0.001$, it is high significant difference.

**Results:**

Table (1): Reveals that, 60.2% of the studied subjects were male while, 39.8% of them were female. 32.9% of them aged from 30 to 40 years old and 61.0% of them were married. 22.0% of them were illiterate. 46.4% of the studied subjects were not working/ house wife and 48.8% of them had not sufficient for basic needs.

Figure (1) Demonstrates that, 32.5% of the studied subjects were read and write while, 22.0% of them were illiterate. Moreover, 19.50% of the studied subjects had secondary school education while, 18.70% of them had basic education and only 7.30% of them had high education.

Table (2) Shows that, 68.3% of the studied subjects had not chronic diseases while, 31.7% of them had. 51.3% of them had diabetes and 33.3% of them had hyper tension. 57.7% of the studied subjects suffered from intestinal diseases while, 65.9 % of them suffered from fever. 72.4% of them used antipyretic drugs. 82.1% of the studied subjects reported not having typhoid fever before while, 17.9% of them reported having typhoid fever before.

Table (3) Shows that, 48.0% of the studied subjects suffered from typhoid for three days and 36.6% of them for a week. 43.9% of them were discovered through clinical investigations while, 30.1% of them were diagnosed through medical examination. 76.4% of the studied subjects suffered from hyperthermia, 61.0% of them suffered from abdominal colic and 52.0% of them suffered from vomiting and diarrhea.

Table (4): Shows that, specific practice about eating habits with $p < 0.05$. In preprogram implementation (30.9 %, 27.6 %, 26.8%, 25.2%) of studied subjects typhoid and paratyphoid disease signs and symptoms, typhoid and the non-medical treatment of Typhoid and paratyphoid disease.

Table (1): Number and Percentage Distribution of the Studied Subjects according to Socio-demographic Characteristics (n=123).

Items	N	%
Sex		
Male	74	60.2
Female	49	39.8
Age		
<20	20	16.3
20 >30	32	26.0
30 - 40	40	32.5
>40	31	25.2
X ±S. D = 31.7 ± 2.99		
Marital status		
Single	31	25.2
Married	75	61.0
Divorced	9	7.3
Widow	8	6.5
Residence		
Urban	32	26.0
Rural	91	74.0
Number of family members		
<3	23	18.7
3-5	75	61.0
>5	25	20.3
X ±S. D =4.03 ± 0.86		
Number of home rooms		
<3	49	39.8
3-5	54	43.9
>5	20	16.3
X ±S. D =3.52 ± 0.73		
Home crowdedness (no. of rooms/ no. of members)		
From 2 to 3	61	49.6
From 4 to 5	29	23.6
More than 5	33	26.8
Education level		
Illiterate	27	22.0
Read and write	40	32.5
Basic education	23	18.7
Secondary education (diploma)	24	19.5
High education	9	7.3
Occupation		
Officer	33	26.8

Technical job	19	15.4
Not working/ house wife	57	46.4
Student	14	11.4
Monthly income		
Enough and sufficient	21	17.1
Sufficient for basic needs	42	34.1
Not sufficient for basic needs	60	48.8

Figure (1): Percentage Distribution of the Studied Subject according to their Educational Level (n=123).

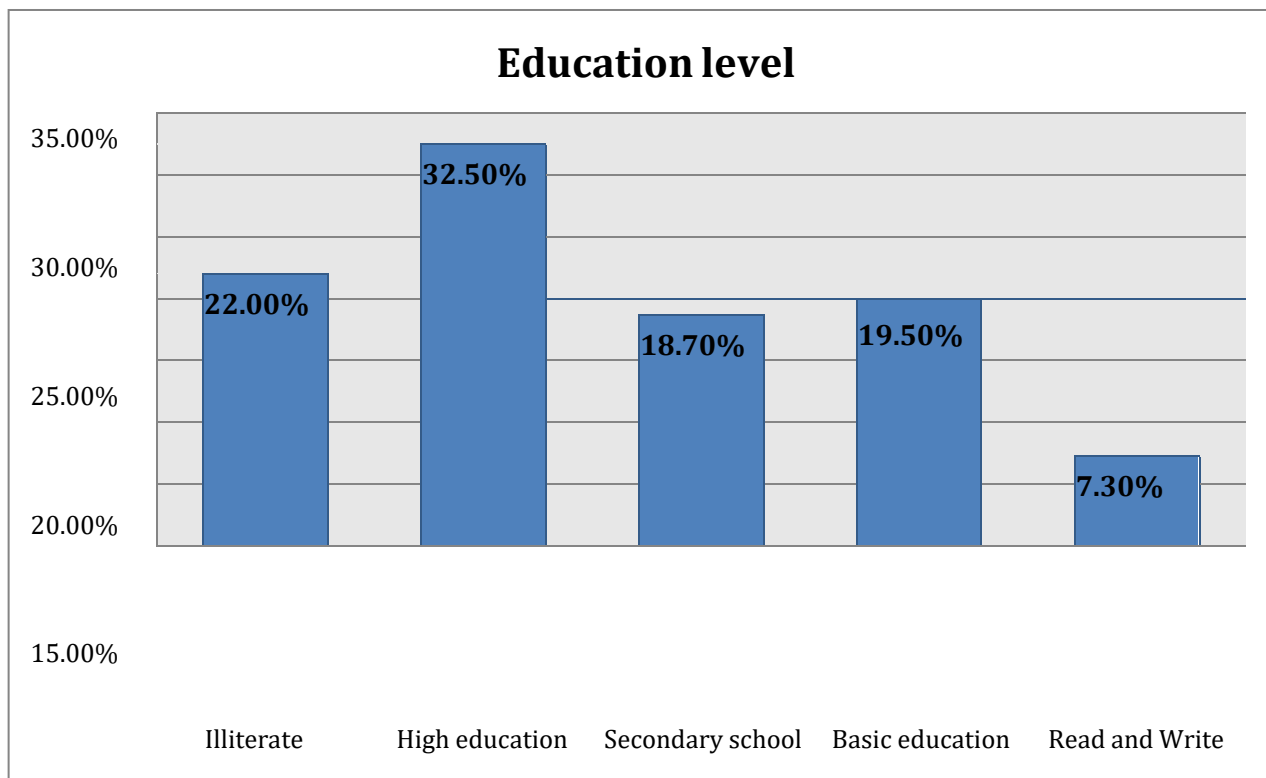


Table (2): Number and Percentage Distribution of the Studied Subjects according to their Past Medical History (n= 123).

Items	N	%
Having chronic diseases		
Yes	39	31.7
No	84	68.3
If yes, the disease is n=39		
Diabetes	20	51.3
Hypertension	13	33.3
Renal disease	2	5.1
Cardiac disease	4	10.3
Suffering from intestinal diseases		
Yes	71	57.7
No	52	42.3
Suffering from fever		
Yes	81	65.9
No	42	34.1
Using antipyretic drugs		
Yes	89	72.4
No	34	27.6
Having typhoid fever before		
Yes	22	17.9
No	101	82.1
Admitted to hospital before		
Yes	45	36.6
No	78	63.4

Table (3): Number and Percentage Distribution of the Subjects according to their Current Medical Complain (n= 123).

Current medical complains	N	%
Duration of typhoid		
3 days	59	48.0
Week	45	36.6
More than week	19	15.4
The disease discovered		
Having symptoms	32	26.0
Clinical Investigation	54	43.9
Medical examination	37	30.1
Suffering from hyperthermia		
Yes	94	76.4
No	29	23.6
Suffering from abdominal colic		
Yes	75	61.0
No	48	39.0
Suffering from vomiting or diarrhea		
Yes	64	52.0
No	59	48.0

Table (4): Studied Subjects Intervention regarding to their Knowledge about Typhoid and Paratyphoid Fever (n=123).

knowledge about typhoid and paratyphoid fever	The study sample			
	Correct		Incorrect	
	No.	%	No.	%
Typhoid and paratyphoid fever definition	34	27.6	89	72.4
Typhoid and paratyphoid disease caused by	28	22.8	95	77.2
Typhoid and paratyphoid disease transmitted through	25	20.3	98	79.7
Typhoid and paratyphoid disease signs and symptoms	38	30.9	85	69.1
People most susceptible to infection	33	26.8	90	73.2
In case of symptoms of typhoid and paratyphoid fever	29	23.6	94	76.4
The treatment of typhoid and paratyphoid is through	27	22.0	96	78.0
The medical treatment of Typhoid and paratyphoid disease is	24	19.5	99	80.5
The non-medical treatment of Typhoid and paratyphoid disease is	31	5.2	92	74.8
Typhoid and paratyphoid disease diagnosed through	30	24.4	93	75.6
Typhoid and paratyphoid disease complications are	22	17.9	101	82.1
Constant hyperthermia affects	26	21.1	97	78.9
Hyperthermia of Typhoid and paratyphoid disease causes	24	19.5	99	80.5
Prevention of typhoid and paratyphoid fever through	32	26.0	91	74.0



Discussion

Typhoid and paratyphoid fever are life-threatening diseases caused by *Salmonella Typhi* and *Salmonella Paratyphoid* bacteria. These bacteria can be spread by eating or drinking contaminated food or water. Typhoid and paratyphoid fever affect an estimated 11–21 million people worldwide each year. These diseases are rare in the United States, but they are common in many countries (13).

They are common in many parts of the world, including South Asia, so travelers to Pakistan, India, and Bangladesh should take precautions to protect themselves from these infections. Other areas of highest risk include parts of East Asia, Africa, the Caribbean, Central and South America, and the Middle East. In the United States, about 425 people are diagnosed with typhoid and 125 with paratyphoid fever each year, most often after traveling outside of the United States (14).

The present study finding revealed that more than half of studied subjects were male and this finding was similar with **Teferi et al., (2022)** who conducted published study at Ethiopia under title of "Prevalence and antimicrobial susceptibility level of typhoid fever in Ethiopia" they found that, 65 % of studied subjects were males.

Concerning age, more than one third of studied subjects had aged from 30 to 40 years old, and this finding was in agreement with **Phillips et al., (2021)** who conducted published study at Vietnam entitled as "A Bayesian approach for estimating typhoid fever incidence from large-scale facility-based passive surveillance data in Ho Chi Minh City, Vietnam" they found that, 39 % of studied subjects were from 30 to 40 years old. From researcher point view, this might be due to some of the elderly from 30 to 40 years old had physical problem and need help to go outpatients.

Concerning the education level of the present study revealed that one third of studied subjects had a were read and write and this finding was similar with **Cutting et al., (2022)** who conducted a published study at Kilimanjaro Region, Tanzania entitled as "Facility-based disease surveillance and Bayesian hierarchical modeling to estimate endemic typhoid fever incidence, Kilimanjaro Region, Tanzania" they founded that, 35.1 % participants had read and write.



Regarding the intestinal diseases, the results of the present study showed that more than half were recently diagnosed with typhoid and paratyphoid fever and this finding was in the same direction with **Choudhary et al., (2020)** who conducted a published study in southern India at a tertiary care hospital under the title "Antimicrobial susceptibility of *Salmonella enterica* serovars in a tertiary care hospital in southern India" they found that, 58.6 % of studied subjects were recently diagnosed with intestinal diseases in the last 5 years.

Also, the present study revealed that more than half and less than three quarters of studied subjects, respectively, had suffered from fever and used antipyretic drugs and this finding was similar with **Ghenghesh et al., (2019)** who conducted a published study at Mediterranean north Africa entitled as "Serology of typhoid fever in an area of endemicity and its relevance to diagnosis" they found that, 58.1 % & 73.8 % respectively, participants had suffered from fever and used antipyretic drugs.

Concerning the present study revealed that more than two thirds of studied subjects had reported not having typhoid fever before and this finding was similar with **Klemm et al., (2020)** who conducted a published study entitled as "Emergence of an extensively drug-resistant *Salmonella enterica* serovar Typhi clone harboring a promiscuous plasmid encoding resistance to fluoroquinolones and third-generation cephalosporins" they found that, 78.1 % participants had reported not having typhoid fever before.

Regarding the duration of disease, the results of the present study showed that less than half of studied subjects were suffered from typhoid for three days and this finding was in the same direction with **Herekar et al., (2022)** who conducted a published study under the title "Clinical spectrum and outcomes of patients with different resistance patterns of *Salmonella enterica*" they found that, 46.6 % of studied subjects were recently suffered from typhoid for three days.

According to the current medical complaints, the results of the present study showed that more than three quarters suffered from hyperthermia and this finding was in the same direction with **Jeon et al., (2022)** who conducted a published study under the title "Typhoid fever presenting with gastric ulcer bleeding" they found that, 77.9 % of studied subjects were recently suffered from hyperthermia.



Also, the present study revealed that more than half of studied subjects had suffered from vomiting or diarrhea and this finding was similar with **Xie et al., (2022)** who conducted a published study entitled as "Paratyphoid Fever A: Infection and Prevention" they found that, 58.1 % participants had reported vomiting or diarrhea.

The present study showed that less than two third & more than two third of studied subjects had incorrect answer about typhoid and paratyphoid fever definition & causes respectively in pre- program regarding total level of knowledge and this finding was in accordance with **Gao et al., (2021)** who conducted published study at specialized medical hospital in Taizhou, China under title " Impact of Temperature and Rainfall on Typhoid/Paratyphoid Fever in Taizhou, China " they found that, less than two third & more than two third of studied subjects had incorrect answer about typhoid and paratyphoid fever definition & causes respectively had incorrect answer.

The present study displayed less than ten percentage presents of studied subjects had incorrect answer about medical treatment of typhoid and paratyphoid disease & signs and symptoms in post-program this finding was agreement with **Harrell et al., (2021)** who conducted published study at Vietnam under title of " Salmonella Biofilm Formation, Chronic Infection, and Immunity Within the Intestine and Hepatobiliary Tract " they found that, 9.8 % & 8.6 % respectively of studied subjects had incorrect answer about medical treatment of typhoid and paratyphoid disease & signs and symptoms. From a researcher's point view, this might be due Discussion 105 to major of them visit out patients at least once every year to receive right information from medical team.

Conclusion

The current study answered the research questions: the most of studied sample had unsatisfactory level of knowledge about typhoid and paratyphoid fever disease, the majority of them had low level of quality of life at environment status, physical and psychological status.

The majority of studied sample had poor in dietary habits and hygienic measures. Results revealed that there was positive correlation between total knowledge of the studied sample regarding to typhoid and paratyphoid fever disease and their dietary habits. Moreover, there was positive correlation between total knowledge of the studied sample and their quality of life.



Recommendations

- Continues health educational programs to all patients in hospitals that help them to improve their quality of life and general health condition.

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