

Effectiveness of Remote Hotline Emergency Triage Services during Covid-19 Crisis in Upper Egypt



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1.ABSTRACT

Remote hotline emergency triage services or telehealth play a critical role in early detection of Covid-19 patients. Triage services decrease overcrowding of patients in hospital by providing remote patient's services. **Aim:** Evaluate the effectiveness of remote hotline emergency triage services during Covid-19 crisis in Upper Egypt. **Design:** Exploratory survey was applied in six Governorates in Upper Egypt: Minia, Assiut, Sohag, Qena, Luxor and Aswan. **Sample:** a purposive sample of approximately 4114 males and females whom had Covid-19 infection and used hotline emergency triage services that offered by the Ministry of Health during the pandemic. **Tools:** two tools were used in the study 1- COVID-19 infected patient's awareness and attitude toward hotline emergency triage services questionnaire, 2- COVID-19 infected people satisfaction toward hotline emergency triage services questionnaire. **Results:** Regarding mean \pm S.D age of the participants patients were (38.2 ± 20.5), and (55 %) of them were female. University education was found in (92.1%) and comorbid diseases were found in (84.2%) of sample. It was found that (87.8%, & 86.8% respectively) of study sample used hotline triage services during Covid-19 crisis and believed that it was effective. Almost about (75.1 & 50.1 % respectively) of the study sample had satisfactory awareness and positive attitude toward using online emergency triage services. **Conclusion:** using remote hotline emergency triage services was effective during Covid-19 crisis in Upper Egypt. **Recommendation:** Include remote hotline emergency triage services in various health specialty, increase nurses and public awareness of the services.

Key words: Remote, Hotline, Emergency Triage, Covid-19, Upper Egypt.

2.Introduction:

Remote hotline emergency triage services is a method of telehealth that concerned with sorting cases and delivering safe medical care to patients remotely via Information and Communications Technology (ICT) infrastructure. In the period of Covid-19 pandemic, telehealth play a critical role in reducing the impact on the economy and healthcare systems (Ashry & Alsawy, 2020). Telemedicine was first used in 1960s and it is defined as providing health-related services using telecommunications and virtual technologies as phones, video-calls, chats, texts and emails, so patients can be kept away from health-care institutions. Telehealth is the most fundamental component of e-health, which relies on a much broader spectrum of information and communication technologies (Carmen, et al., 2018).

Through the remote hotline emergency triage the distant nurse can detect Covid-19 patients early. Furthermore, it reduces patient overcrowding in emergency departments (ED) by remotely monitoring patients' vital signs and manifestation of

infection via a highly qualified nurses in emergency and critical care. During remote hotline triage, emergency nurses evaluates the severity level of illness to see if they need emergency admission or intensive care unit. (Shouman, et al 2021). Remote hotline or Telephone triage is a critical component of a successful critical care system and is a necessary tool for managing risk patients. Patients who would otherwise present at hospital emergency departments and risk spreading covid-19 can also be given advice on the phone by trained health professionals (Alhaidari, et al., 2021).

Nowadays remote hotline emergency triage services was utilized from the Ministry of Health to support the healthcare services in Egypt using traditional communication technologies such as telephone, social media, and video calls. Currently, advances in Information and Communication Technology (ICT) have enabled telehealth to be integrated into the routine care of patients. Egypt health is aiming to extend universal remote telehealth coverage; this enhances the demand of

remote telehealth in routine health services (Khalifa, 2020).

2.1 Significance of the study

Coronavirus disease (Covid-19) is the latest new member of corona virus family causing severe Acute Respiratory Distress Syndrome (ARDS) leading to pneumonia and respiratory failure in humans. (Marwa, et al., 2020). Throughout the COVID-19 pandemic, patients who require ICU management may outnumber the total of intensive care beds, even in developed countries. Consequently, triage may become necessary (Booke & Booke, 2021). According the WHO (2020) it was reported that 40% of infected patients reported as mild and moderate infection which can be accomplished either at home, or inpatient; also 15% of patients reported as severe infection which will require oxygenation for dyspnea, and hypoxia. While 5% of infected patients were considered as critical and needs mechanical ventilation, to support severe respiratory failure, shock, or multi-organ failure. So the present study will assess the effectiveness of remote hotline emergency triage services in sorting cases and also patient's attitude and satisfaction toward it.

2.2 Aim of the study

To evaluate the effectiveness of remote hotline emergency triage services during Covid-19 crisis in Upper Egypt

2.3 Research questions

1. What is the effectiveness of remote hotline emergency triage services during COVID-19 crisis in Upper Egypt?
2. What is the awareness and attitude of Covid-19 infected patients toward hotline emergency triage services during the pandemic?
3. What is the satisfaction level of Covid-19 infected patients toward hotline emergency triage services during the pandemic?

3 Subject and Methods

3.1 Design: Exploratory survey.

3.2 Setting: the current research was applied in six governorates in Upper Egypt they were Minia, Assiut, Sohag, Qena, Luxor and Aswan.

3.3 Sample: purposive sample of approximately 4114 males and females were infected with corona virus and used hotline emergency triage services offered by the Ministry of Health during the pandemic. Data were collected online from August (2020) to March (2021) while in this period all Egyptians population were under obligatory

quarantine in order to reduce the rising number of cases.

3.4 Tools: two tools were used in the current study

Tool I: Covid-19 infected patient's awareness and attitude toward hotline emergency triage services questionnaire was prepared by the researchers after reviewing the related literature (Ashry, & Alsawy, 2020., Alhaidari, et al., 2021, Henry, et al., 2021 and Khalifa, 2020). Included three parts to assess the following items:

Part one: Patient socio-demographic and clinical data assessment sheet. Used to assess the following items, patient age, sex, level of education, Location (Urban or rural), Covid-19 infection manifestation's severity (mild – moderate – severe) as reported by the patients to the services provider (doctor or nurse). Remote hotline triage services outcomes as (home isolation - respiratory clinic advice- hospital isolation- and ICU admission).

Part two: Covid-19 infected patient's awareness toward hotline emergency triage services questionnaire which included six true and false questions were used to assess infected patient's awareness toward hotline emergency triage. Each question scored (1 = yes) and (zero = No). The total score was 6 degrees. If the overall score is (60%) or more, it is considered satisfactory knowledgeable; however, if it is less than (60%), it is considered unsatisfactory.

Part three: Attitude questionnaire scale about the advantages and disadvantages of the hotline emergency triage services. It consisted of fifteen statements to assess the advantages and disadvantages of hotline emergency triage services that offered during Covid-19 pandemic. This tool consisted of eight positive statements (from one to eight). Each statement was assessed as (1= yes, 0 = no) and 7 negative statements from (9 to 15) to assess disadvantage of hotline emergency triage services. Each statement was assessed as (0 = yes, 1= no). This tool has a higher score of (15) and a lower score of (0). If the overall score is less than 60%, it is termed negative attitude; however, if it is equal to or greater than 60%, it is deemed positive attitude.

Tool II: Infected people satisfaction toward hotline emergency triage services questionnaire: This tool was prepared by the researchers after reviewing the related literature (Eccles, et al., 2019, Kamal Helmy, et al., 2021, Eldh, et al., 2020, Nasser, et al., 2021 and Isautier, et al., 2020) to assess patient satisfaction toward hotline emergency triage services. It consists of six

statements assessed by a five-point Likert scale with scores ranging from zero to four (zero = strongly disagree to four = strongly agree). The overall score could range from a minimum of zero to a maximum, of twenty-four.

3.5 Method

- **Ethical consideration:** ethical approval for this study was obtained from the Institution of Review Board of the Faculty of Nursing Minia University and the documentation ethical number was 55 at 18\8\2021.
- Before beginning the online questionnaire, the researchers offered sufficient information on the study's purpose and importance. Permission to perform the study (consent) via online request issued by short social media message or E-mail from the researchers to all the online groups' in the Upper Egypt social media webpages such as (Facebook, Whats-App and Messenger). Before starting the questionnaires, each participant was sent their informed consent through the internet in the form of short online message. Researcher pledged to keep participants responses private.

3.6 Tools validity

- Five expert professors in critical care and emergency nursing specialty were assessed the tools' validity. Cronbach's alpha test was used to assess tool reliability a (0.88 %, 0.95% and 0.85%) for both tools (Tool one, and tool two respectively).
- **A pilot study:** was carried out on 414 Covid-19 infected patients to test the tools for clarity, objectivity, and feasibility, then necessary modifications were done and their results were excluded.

3.7 Data collection:

1. Researchers were prepared the online tools using Google docs' website.
2. The questionnaires were structured so that all questions must be answered, and they were unable to submit the questionnaire until they have signed all questions and only one answer or response for each statement.
3. The questionnaire sheets were available for all people whom used online emergency triage type and other types of services offered by the Ministry of Health (as: emergency unit, private clinics and outpatient clinics of the chest or isolation hospitals).
4. Covid-19 infected patients were allowed to use the study tools through the social

networking webpages such as (Facebook, Messenger, and Whats-App, as well as personal e-mails).

5. Online open channel for communication was established between the researchers and participants in order to verify any misconceptions about the tools through the same social media websites.

3.8 Statistical analysis

The data were tested for normality using the Anderson-Darling test and for homogeneity variances prior to further statistical analysis. Categorical variables were described by number and percent (n, %), where continuous variables were described by mean and standard deviation (Mean, S.D). Chi-square test and Fisher exact test were used to compare between categorical variables. Person Correlation was used to present the association between scores. Two-tailed $p < 0.05$ was considered statistically significant. All Data were computerized using the software of Statistical Package for the Social Sciences (SPSS) version 20 to analyses, code, and tabulate the data.

4. Results

Table 1: Shows distribution of socio-demographic and clinical data of the covid-19 patient. Regarding age (41.2%) of the patients were between (18-25 year) with mean \pm S.D (38.2 \pm 20.5) and (55.1 %) of them were female. Regarding education (92.1%) had university education. It was found that (59.4%) lives in urban. The same table revealed that (84.2%) had comorbid diseases and (39.8%) had mild Covid-19 manifestation. Home isolation after using remote hotline emergency triage services selected (58.8%) and only (10.6 %) had ICU admission.

Table 2: Explain the distribution of Covid-19 patient's awareness toward hotline emergency triage services. It was observed that (87.8%) of sample used the remote hotlines triage services during covid-19 crisis. The table shows that (67.3, 79.4%, and 63.4% respectively) patient's asked about the manifestation and suitable assessment were done, in addition to, treatment, and followed up their condition through the remote hotline triage services respectively. Also (86.8%) think that remote hotline triage services was effective during Covid-19 crisis.

Table (3): showed that patients who believed that remote hotline emergency triage services had advantages were about (85.7%), and (91.5% , 86.3 respectively) had positive attitude and agreed that remote hotlines emergency triage services decreased contact with infected person and

decreased overload in emergency units. The same table revealed that (74.6 %) of respondents believed that the services had disadvantages and (84.2%) of patients had negative attitude because the remote hotline emergency triage services were very busy during calling.

Table (4): Shows the distribution of patients' satisfaction toward remote hotline emergency triage services during Covid-19 crisis. It was found (42.9%, 39.7% respectively) of study sample were satisfied with the ability to talk freely and understand the treatment and advice delivered through the remote hotline emergency services. On the other hand (37.0 %, 34.5% respectively) agree that the services provide suitable treatment and wishes to use video calls.

Table (5): Shows the distribution of covid-19 patients' maximum awareness and attitude toward the services, they were (75.1 and 50, 1 % respectively) of the study sample had satisfactory

Table (1):- Distribution of demographic and clinical data of Covid-19 patients used remote hotline emergency triage services (no =4114)

Socio-demographic data	No	%
Age		
From 18-25 year	1695	41.2
From 26-35 year	1479	36.0
From 36-45 year	590	14.3
From 46 and more	350	8.5
Mean ± S.D	38.2 ± 20.5	
Gender		
Female	2269	55.1
Male	1845	45
Education		
Primary	21	.5
Preparatory	22	.5
Secondary	284	6.9
University	3787	92.1
Occupation		
Student	1231	29.9
Private Work	174	4.2
Not Working	440	10.7
Employee	2269	55.2
Place of Residence		
Rural	1671	40.6
Urban	2443	59.4
clinical data		
What is Your Source of Knowledge about remote Hotline emergency Triage services?		
Friends	218	5.3
T.V	1065	25.9
Health care provider	761	18.5
Social media	2070	50.3
Severity of Covid-19 infection while using remote hotline emergency triage		

awareness and positive attitude toward using hotline emergency triage services.

Table (6): Shows a statistical significant correlation between the study sample's satisfaction, awareness and attitude toward remote hotline emergency triage services with P value less than (0.001).

Table (7): Shows the relationship between the patients' awareness and their socio-demographic data toward the remote hotline emergency triage services were statistical significant differences with P value less than (0.001).

Table (8): Shows statistical significant differences in the relation between patients' attitude and their socio-demographic data toward the remote hotline emergency triage services presented by P value less than (0.001).

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services?		
Mild	1639	39.8
Moderate	1388	33.7
Sever	1087	26.4
Comorbidities		
Yes	650	15.8
No	3464	84.2
Reason for using remote hotline emergency triage services?		
Inquiries about home isolation.	721	17.5
Inquire about the presence of covid-19 manifestations.	739	18.0
Covid-19 sever case need emergency isolation.	696	16.9
Multiple reasons.	1958	47.6
Patient's triage outcomes after using remote hotline services		
Go to the Respiratory Clinic.	542	13.2
Home Isolation.	2418	58.8
Hospital Isolation.	718	17.5
ICU Admission.	436	10.6

Table (2):- Distribution of Covid-19 infected patient' awarenes toward remote hotline emergency triage services (n=4114)

Study sample awareness	No	%
Did you use hotline remote emergency triage services for corona virus?		
No	502	12.2
Yes	3612	87.8
Did you access suitable assessment for the manifestation (primary survey) throughout the hotline remote triage?		
No	1346	32.7
Yes	2768	67.3
Did you receive treatment for covid-19 manifestation through the services?		
No	847	20.6
Yes	3267	79.4
Did you discuss the treatment or advice through the hotline triage services?		
No	1176	28.6
Yes	2938	71.4
Did you follow up through the remote hotline triage services?		
No	1506	36.6
Yes	2608	63.4
Did you think that remote hotline emergency triage was effective during COVID -19 crisis?		
No	544	13.2
Yes	3570	86.8

Table (3):- Distribution of covid-19 patient's attitude toward remote hotline emergency triage services (n=4114)

Covid-19 infected patient's attitude	No	%
Did you think that remote hotline emergency triage has an advantages?		
No	590	14.3
Yes	3524	85.7
If yes, Which is the most advantages?		
Rapid initial assessment (primary survey).	3158	76.8
Decrease visit to outpatient clinic.	3372	82.0
Facilitate diagnosis, treatment and advice.	2892	70.3
Save time and money.	3524	85.7

Decrease contact with infected person.	3765	91.5
Decrease over loud in emergency unites.	3549	86.3
Provide appropriate emergency instructions for covid-19 cases.	3504	85.2
Did you think that remote hotline triage services has disadvantages?		
No	1047	25.4
Yes	3067	74.6
If yes, Which most disadvantages?		
Very busy during calling.	3463	84.2
Misunderstand the remote hotline treatment.	2334	56.7
Wrong initial assessment.	2292	55.7
Inability to physical exam or actual face to face communication.	3250	79.0
Medical error (error in treatment and advice).	2814	68.4
Services can jeopardize patient privacy.	2053	49.9

Table (4):- Distribution patients' satisfaction toward remote hotline emergency triage services during COVID - 19 crisis. (n=4114)

Patient's satisfaction	No	%
Ease to access to remote hotline services.		
Strongly disagree	305	7.4
Disagree	429	10.4
Undecided	1849	44.9
Agree	1445	35.1
strongly agree	86	2.1
Ability to talk free with doctor or nurses during the remote hotline calls.		
Strongly disagree	370	9.0
Disagree	543	13.2
Undecided	1329	32.3
Agree	1764	42.9
strongly agree	108	2.6
Ability to understand the treatment and advice throughout the remote hotline calls.		
Strongly disagree	372	9.0
Disagree	476	11.6
Undecided	1568	38.1
Agree	1633	39.7
Strongly agree	65	1.6
Suitable treatment for covid-19 manifestation delivered throughout the services.		
Strongly disagree	435	10.6
Disagree	457	11.1
Undecided	1613	39.2
Agree	1522	37.0
Strongly agree	87	2.1
Remote hotline triage calls will be suitable for all cases		
Strongly disagree	742	18.0
Disagree	1109	27.0
Undecided	938	22.8

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Agree		1216	29.6
Strongly agree		109	2.6
Shifting of the hotline triage services to video calling will be effective?			
Strongly disagree		371	9.0
Disagree		432	10.5
Undecided		1149	27.9
Agree		1789	43.5
Strongly agree		373	9.1
Level of patient's satisfaction	Max Score	No	%
Poor	<50%	1915	46.5
Faire	From 50-70%	1305	31.7
Good	>70%	894	21.7
Mean ± SD (range)	24	12.58±4.73(0-24)	

Table (5):- Distribution of patients' maximum awareness and attitude toward remote hotline emergency triage services (no=4114)

	Max Score	No	%
Patients awareness toward remote hotline emergency triage services			
Unsatisfactory	<60%	1024	24.9
Satisfactory	≥60%	3090	75.1
Mean ± SD(range)	6	4.56±1.73(0-6)	
Patients attitude toward remote hotline emergency triage services			
Negative	<60%	2051	49.9
Positive	≥60%	2063	50.1
Mean ± SD(range)	9.63±3.65(0-16)		

Table (6):- Correlation co-efficient between patients' satisfaction with awareness and attitude toward remote hotline emergency triage services

Patient awareness and attitude	Patients Satisfaction toward Remote Hotline Emergency Triage Services during COVID-19	
	R	P
Patients awareness toward hotline emergency triage services	0.608	<0.001**
Patients attitude toward remote hotline emergency triage services	0.587	<0.001**

****Statistically Significant Correlation at P. value <0.01**

Table (7):- Relationship between patients' awareness toward remote hotline emergency triage services and their socio-demographic data (n=4114)

Patient's demographic data	Negative Awareness		Positive awareness		Total		X ²	P. value
	No	%	No	%	No	%		
Age								
Less than 18 year	0	0.0	42	1.4	42	1.0	183.065	<0.001**
From 18-25 year	347	33.9	1348	43.6	1695	41.2		
From 26-35 year	435	42.5	1044	33.8	1479	36.0		
From 36-45 year	88	8.6	502	16.2	590	14.3		
From 46 and more	154	15.0	154	5.0	308	7.5		
Education								
Primary	0	0.0	21	0.7	21	0.5	44.511	<0.001**

Preparatory	0	0.0	22	0.7	22	0.5		
Secondary	110	10.7	174	5.6	284	6.9		
University	914	89.3	2873	93.0	3787	92.1		
Occupation								
Student	130	12.7	1101	35.6	1231	29.9	466.777	<0.001**
Private Work	131	12.8	43	1.4	174	4.2		
Not Working	198	19.3	242	7.8	440	10.7		
Employee	565	55.2	1704	55.1	2269	55.2		
Place of Residence								
Rural	392	38.3	1279	41.4	1671	40.6	3.085	0.079
Urban	632	61.7	1811	58.6	2443	59.4		

Table (8):- Relationship between patients’ attitude toward remote hotline emergency triage services and their socio-demographic data (n=4114)

	Negative Attitude		Positive attitude		Total		X ²	P. value
	No	%	No	%	No	%		
Age							340.851	<0.001**
Less than 18 year	21	1.0	21	1.0	42	1.0		
From 18-25 year	916	44.7	779	37.8	1695	41.2		
From 26-35 year	850	41.4	629	30.5	1479	36.0		
From 36-45 year	88	4.3	502	24.3	590	14.3		
From 46 and more	176	8.6	132	6.4	308	7.5		
Education							59.952	<0.001**
Primary	0	0.0	21	1.0	21	0.5		
Preparatory	22	1.1	0	0.0	22	0.5		
Secondary	175	8.5	109	5.3	284	6.9		
University	1854	90.4	1933	93.7	3787	92.1		
Occupation							323.834	<0.001**
Student	479	23.4	752	36.5	1231	29.9		
Private Work	152	7.4	22	1.1	174	4.2		
Not Working	352	17.2	88	4.3	440	10.7		
Employee	1068	52.1	1201	58.2	2269	55.2		
Place of Residence								
Rural	871	42.5	800	38.8	1671	40.6	5.802	0.016*
Urban	1180	57.5	1263	61.2	2443	59.4		

Chi square test for qualitative data between the two groups or More **Significant level at P value < 0. 0.01

5. Discussion

The World Health Organization (WHO) and the Egyptian Ministry of Health listed remote hotline emergency triage services or telehealth as one of the essential services in their "Strengthening the health systemic responses to Covid-19" policy. This risk can be mitigated through telehealth by reducing face-to-face interactions. Therefore the present study was done to evaluate the effectiveness of remote hotline emergency triage

services during COVID-19 crisis in Upper Egypt (World Health Organization 2020).

Concerning patient socio-demographic data, the present study revealed that less than half of the study sample age were between (18-25 year old) with mean ±S.D (38.2 ± 20.5), more than half of them were female and the majority of them had a university education. All of the participants in the current study were from Upper Egypt. Which mean that age and education affect the awareness of the services. The present study results were in line with Alborai, et al., (2021) they found that the patient’s

mean age was (36:7 ± 11.2 years), more than half of them were female and more than half of participants were from Lower Egypt and nearly thirty percent were from Cairo. **Booke, & Booke, (2021)** reported that In Italy, France, and Spain, age has been used as triage parameter to decide who needed ICU admission, and the others who received palliative care, because the number of ICU admitted cases exceeds the number of bed so they considered age as an easy tool for cases triage.

In relation to patient's clinical data the result of the current study revealed that the majority of study sample had comorbid diseases and less than half of them had a mild to moderate signs and symptoms of Covid-19 infection. Also more than half of them were classified as home isolation after using remote hotline emergency triage services and lower percentage had ICU admission. The present results prove that hotline emergency triage was effective in sorting cases through primary survey done by nurses and providing suitable treatment by for Covid-19 cases according to the WHO published protocol by specialized doctors. This findings were congruent with **Al-Samarraie, et al., (2021)** they found that only (23 %) of the participants had chronic pathologies, mainly hypertension and diabetes mellitus and had mild to moderate Covid-19. Also **Moreno-Mulet, et al (2021)** reported that only (10 %) of the covid-19 infected patients were ICU admitted and the majority can receive management through home isolation.

Regarding the patient's' awareness and attitude toward hotline remote hotline emergency triage services. The result of the current study presents that majority of sample aware of using hotlines emergency triage services. Respondents believed that hotline emergency triage services were effective in providing emergency assessment of their manifestation (phone primary survey) by emergency nurses, they received quickly treatment and follow up by qualified doctors. **Elsaie, et al., (2020)** reported that the majority of respondents agreed that COVID 19 pandemic is a suitable time to start remote telehealth protocols, however the overwhelming 234 (83.6 %) of patients desired to use it on a trial basis initially before full implementation.

Covid-19 infected patients reported that using of remote hotline triage services has advantages such as decreased contact with infected person, take treatment for emergency cases, without increasing overload in emergency unit after rapid primary assessment throughout tele-communication methods. **Ashry et al., (2020)**

agreed with the present study and reported that telehealth services is a way of giving safe medical services to patients remotely via videoconferencing, voice conversations, messages, and emails. In the midst of the Covid-19 pandemic, virtual outpatient clinics appeared to be a safe and successful mode of management.

The same result was in line with **Elsaie, et al., (2020)** they reported that most of the participants using hotline triage agreed and strongly agreed that providing emergency advice and treatment were delivered more quickly than in the past through telehealth. Likewise, they believed that hotline triage is vital for patient care and essential for bringing medical treatment to neglected sections of the healthcare system. Moreover **Monaghesh & Hajizadeh (2020)** reported that using remote hotline triage services enhances the provision of health services. As a result, during the Covid-19 outbreak, telehealth services should be a vital tool in providing care while keeping patients and health team safe.

Patient satisfaction is the most important indicator of the health care, they provides feedback for evaluating the nursing, and medical care quality. Results of the current study revealed that more than two-third of study sample were satisfied about using of remote hotline triage services. About one-third of participant agree about the ability to talk free while assessment, they understand the instruction and treatment given by the health team through remote hotline emergency triage services and wishes to use video calls during the services. These findings are in line with another study conducted by **Alshammari, et al., (2019)** the majority of the surveyed participants felt that telemedicine saves time, money, transportation costs while also reducing hospital wait times and infection contact.

Alboraie, et al., (2021) reported that two-thirds of the participants agreed or strongly agreed that telemedicine increased communication between patients and their doctors or nurses, which backed up the study's findings. In emergency, a comparable percentage agreed that telemedicine could assist in providing suitable directions. In general, 60.8% of participants prefer telemedicine to traditional methods. Also **Li, et al., (2020)** demonstrated that remote emergency triage services provided equivalent patient safety and satisfaction when compared to in-person reviews. Patients like the service, and it lowers the chance of Covid-19 transmission. The Covid-19 epidemic has compelled the extensive use of telehealth services, which patients and health-care workers favor.

Relationship between the patient's awareness and attitude toward the remote hotline triage services and their socio-demographic and clinical data. The current study revealed statistically significant differences between study sample awareness, attitude and their age, education and occupation with P value <0.001. These findings were in line with **Al-Samarraie, et al., (2020)** according to their findings, unemployed and less educated participants showed less understanding and a negative attitude about telemedicine than other job categories and people with higher education. Finally, developing an electronic triage system tailored to Covid-19 nature and characteristics will benefit patient health care facilities significantly. Nurses and doctors in emergency units needs will education and training to well serve patients while using remote hotline emergency triage system.

6. Conclusion

Based on the result of the current study that using remote hotline emergency triage services was effective and satisfactory for patients in delivering safe emergency nursing advice during Covid-19 crisis in Upper Egypt.

7. Recommendation:

- Include remote hotline emergency triage services in various health specialty.
- Providing high standard education and training for critical care nurses and doctors about telehealth will aid in improving the quality of remote triage services.
- Increase public awareness of remote hotline emergency triage calls.
- Future research evaluating the effectiveness of remote hotline triage services in all Egypt.

8. Acknowledgment

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