Effectiveness of Remote Hotline Emergency Triage Services during Covid-19

Crisis in Upper Egypt

Naglaa Ahmed Ahmed1 Fayza Ahmed Abdou Mohammed Komsan2 Naglaa Gamal Eldien Abdelhafez Hrariedy3
Marwa Mohammad Abd Elbakry4

Assistant Professor, Critical Care Nursing and Emergency, Faculty of Nursing, Assiut, University, Egypt1, Assistant professor .Critical Care and Emergency Nursing Department, Faculty of Nursing, Assiut, University, Egypt2, Assistant Professor, Critical Care Nursing and Emergency, Faculty of Nursing, Sohage University, Egypt3, Assistant Professor, Critical Care Nursing and Emergency, Faculty of Nursing, Minia University, Egypt4

Corresponding Author: Marwa.radwan1@mu.edu.eg

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 ± 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
Effectiveness of Remote Hotline Emergency Triage...

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 andMessenger). 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 ±S.D (38.2 ± 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 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).

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

<table>
<thead>
<tr>
<th>Socio-demographic data</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>From 18-25 year</td>
<td>1695</td>
<td>41.2</td>
</tr>
<tr>
<td>From 26-35 year</td>
<td>1479</td>
<td>36.0</td>
</tr>
<tr>
<td>From 36-45 year</td>
<td>590</td>
<td>14.3</td>
</tr>
<tr>
<td>From 46 and more</td>
<td>350</td>
<td>8.5</td>
</tr>
<tr>
<td>Mean ± S.D</td>
<td></td>
<td>38.2 ± 20.5</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>2269</td>
<td>55.1</td>
</tr>
<tr>
<td>Male</td>
<td>1845</td>
<td>45</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>21</td>
<td>.5</td>
</tr>
<tr>
<td>Preparatory</td>
<td>22</td>
<td>.5</td>
</tr>
<tr>
<td>Secondary</td>
<td>284</td>
<td>6.9</td>
</tr>
<tr>
<td>University</td>
<td>3787</td>
<td>92.1</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student</td>
<td>1231</td>
<td>29.9</td>
</tr>
<tr>
<td>Private Work</td>
<td>174</td>
<td>4.2</td>
</tr>
<tr>
<td>Not Working</td>
<td>440</td>
<td>10.7</td>
</tr>
<tr>
<td>Employee</td>
<td>2269</td>
<td>55.2</td>
</tr>
<tr>
<td>Place of Residence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>1671</td>
<td>40.6</td>
</tr>
<tr>
<td>Urban</td>
<td>2443</td>
<td>59.4</td>
</tr>
</tbody>
</table>

Clinical data:

What is Your Source of Knowledge about remote Hotline emergency Triage services?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Friends</td>
<td>218</td>
</tr>
<tr>
<td>T.V</td>
<td>1065</td>
</tr>
<tr>
<td>Health care provider</td>
<td>761</td>
</tr>
<tr>
<td>Social media</td>
<td>2070</td>
</tr>
</tbody>
</table>

Severity of Covid-19 infection while using remote hotline emergency triage services:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Effectiveness of Remote Hotline Emergency Triage...

<table>
<thead>
<tr>
<th>Comorbidities</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>650</td>
<td>3464</td>
</tr>
<tr>
<td>No</td>
<td>3464</td>
<td>650</td>
</tr>
</tbody>
</table>

Reason for using remote hotline emergency triage services?

<table>
<thead>
<tr>
<th>Reason for using remote hotline emergency triage services</th>
<th>Did you access suitable assessment for the manifestation (primary survey) throughout the hotline remote triage?</th>
<th>Study sample awareness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inquiries about home isolation.</td>
<td>No</td>
<td>502 (12.2)</td>
</tr>
<tr>
<td>Inquiries about the presence of covid-19 manifestations.</td>
<td>Yes</td>
<td>3612 (87.8)</td>
</tr>
<tr>
<td>Covid-19 severe case need emergency isolation.</td>
<td></td>
<td>1346 (32.7)</td>
</tr>
<tr>
<td>Multiple reasons.</td>
<td>Yes</td>
<td>2768 (67.3)</td>
</tr>
</tbody>
</table>

Patient’s triage outcomes after using remote hotline services

<table>
<thead>
<tr>
<th>Patient’s triage outcomes after using remote hotline services</th>
<th>Go to the Respiratory Clinic.</th>
<th>Study sample awareness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Go to the Respiratory Clinic.</td>
<td>No</td>
<td>542 (13.2)</td>
</tr>
<tr>
<td>Home Isolation.</td>
<td>Yes</td>
<td>2418 (58.8)</td>
</tr>
<tr>
<td>Hospital Isolation.</td>
<td></td>
<td>718 (17.5)</td>
</tr>
<tr>
<td>ICU Admission.</td>
<td></td>
<td>436 (10.6)</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Did you use hotline remote emergency triage services for corona virus?</th>
<th>Study sample awareness</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>502 (12.2)</td>
</tr>
<tr>
<td>Yes</td>
<td>3612 (87.8)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Did you access suitable assessment for the manifestation (primary survey) throughout the hotline remote triage?</th>
<th>Study sample awareness</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>1346 (32.7)</td>
</tr>
<tr>
<td>Yes</td>
<td>2768 (67.3)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Did you receive treatment for covid-19 manifestation through the services?</th>
<th>Study sample awareness</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>847 (20.6)</td>
</tr>
<tr>
<td>Yes</td>
<td>3267 (79.4)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Did you discuss the treatment or advice through the hotline triage services?</th>
<th>Study sample awareness</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>1176 (28.6)</td>
</tr>
<tr>
<td>Yes</td>
<td>2938 (71.4)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Did you follow up through the remote hotline triage services?</th>
<th>Study sample awareness</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>1506 (36.6)</td>
</tr>
<tr>
<td>Yes</td>
<td>2608 (63.4)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Did you think that remote hotline emergency triage was effective during COVID-19 crisis?</th>
<th>Study sample awareness</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>544 (13.2)</td>
</tr>
<tr>
<td>Yes</td>
<td>3570 (86.8)</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Covid-19 infected patient’s attitude</th>
<th>Study sample awareness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did you think that remote hotline emergency triage has an advantages?</td>
<td>No</td>
</tr>
</tbody>
</table>

If yes, Which is the most advantages?

<table>
<thead>
<tr>
<th>Did you think that remote hotline emergency triage has an advantages?</th>
<th>Study sample awareness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rapid initial assessment (primary survey).</td>
<td>3158 (76.8)</td>
</tr>
<tr>
<td>Decrease visit to outpatient clinic.</td>
<td>3372 (82.0)</td>
</tr>
<tr>
<td>Facilitate diagnosis, treatment and advice.</td>
<td>2892 (70.3)</td>
</tr>
<tr>
<td>Save time and money.</td>
<td>3524 (85.7)</td>
</tr>
</tbody>
</table>
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?**

<table>
<thead>
<tr>
<th></th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>1047</td>
<td>25.4</td>
</tr>
<tr>
<td>Yes</td>
<td>3067</td>
<td>74.6</td>
</tr>
</tbody>
</table>

**If yes, Which most disadvantages?**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Very busy during calling.</td>
<td>3463</td>
<td>84.2</td>
</tr>
<tr>
<td>Misunderstand the remote hotline treatment.</td>
<td>2334</td>
<td>56.7</td>
</tr>
<tr>
<td>Wrong initial assessment.</td>
<td>2292</td>
<td>55.7</td>
</tr>
<tr>
<td>Inability to physical exam or actual face to face communication.</td>
<td>3250</td>
<td>79.0</td>
</tr>
<tr>
<td>Medical error (error in treatment and advice).</td>
<td>2814</td>
<td>68.4</td>
</tr>
<tr>
<td>Services can jeopardize patient privacy.</td>
<td>2053</td>
<td>49.9</td>
</tr>
</tbody>
</table>

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

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

<table>
<thead>
<tr>
<th>Agreement Level</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>109</td>
<td>2.6</td>
</tr>
<tr>
<td>Agree</td>
<td>1216</td>
<td>29.6</td>
</tr>
<tr>
<td>Disagree</td>
<td>432</td>
<td>10.5</td>
</tr>
<tr>
<td>Undecided</td>
<td>1149</td>
<td>27.9</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>371</td>
<td>9.0</td>
</tr>
</tbody>
</table>

**Shifting of the hotline triage services to video calling will be effective?**

<table>
<thead>
<tr>
<th>Agreement Level</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly disagree</td>
<td>371</td>
<td>9.0</td>
</tr>
<tr>
<td>Disagree</td>
<td>432</td>
<td>10.5</td>
</tr>
<tr>
<td>Undecided</td>
<td>1149</td>
<td>27.9</td>
</tr>
<tr>
<td>Agree</td>
<td>1789</td>
<td>43.5</td>
</tr>
<tr>
<td>Strongly agree</td>
<td>373</td>
<td>9.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level of patient’s satisfaction</th>
<th>Max Score</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor</td>
<td>&lt;50%</td>
<td>1915</td>
<td>46.5</td>
</tr>
<tr>
<td>Faire</td>
<td>From 50-70%</td>
<td>1305</td>
<td>31.7</td>
</tr>
<tr>
<td>Good</td>
<td>&gt;70%</td>
<td>894</td>
<td>21.7</td>
</tr>
</tbody>
</table>

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 (n=4114)

<table>
<thead>
<tr>
<th>Patients awareness toward remote hotline emergency triage services</th>
<th>Max Score</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unsatisfactory</td>
<td>&lt;60%</td>
<td>1024</td>
<td>24.9</td>
</tr>
<tr>
<td>Satisfactory</td>
<td>≥60%</td>
<td>3090</td>
<td>75.1</td>
</tr>
</tbody>
</table>

Mean ± SD(range): 6 4.56±1.73(0-6)

<table>
<thead>
<tr>
<th>Patients attitude toward remote hotline emergency triage services</th>
<th>Max Score</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative</td>
<td>&lt;60%</td>
<td>2051</td>
<td>49.9</td>
</tr>
<tr>
<td>Positive</td>
<td>≥60%</td>
<td>2063</td>
<td>50.1</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Patient awareness and attitude</th>
<th>Patients Satisfaction toward Remote Hotline Emergency Triage Services during COVID-19</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R</td>
</tr>
<tr>
<td>Patients awareness toward hotline emergency triage services</td>
<td>0.608</td>
</tr>
<tr>
<td>Patients attitude toward remote hotline emergency triage services</td>
<td>0.587</td>
</tr>
</tbody>
</table>

**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)

<table>
<thead>
<tr>
<th>Patient’s demographic data</th>
<th>Negative Awareness</th>
<th>Positive awareness</th>
<th>Total</th>
<th>X²</th>
<th>P. value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>No %</td>
<td>No %</td>
<td>No %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 18 year</td>
<td>0 0.0</td>
<td>42 1.4</td>
<td>42 1.0</td>
<td>183.065</td>
<td>&lt;0.001**</td>
</tr>
<tr>
<td>From 18-25 year</td>
<td>347 33.9</td>
<td>1348 43.6</td>
<td>1695 41.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>From 26-35 year</td>
<td>435 42.5</td>
<td>1044 33.8</td>
<td>1479 36.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>From 36-45 year</td>
<td>88 8.6</td>
<td>502 16.2</td>
<td>590 14.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>From 46 and more</td>
<td>154 15.0</td>
<td>154 5.0</td>
<td>308 7.5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Education                  | No %               | No %               | No %  |    |         |
| Primary                    | 0 0.0             | 21 0.7             | 21 0.5 | 44.511 | <0.001** |

45
Table (8): Relationship between patients’ attitude toward remote hotline emergency triage services and their socio-demographic data (n=4114)

<table>
<thead>
<tr>
<th>Negative Attitude</th>
<th>Positive attitude</th>
<th>Total</th>
<th>X²</th>
<th>P. value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>%</td>
<td>No</td>
<td>%</td>
<td>No</td>
</tr>
<tr>
<td>Less than 18 year</td>
<td>21 1.0</td>
<td>21</td>
<td>1.0</td>
<td>42</td>
</tr>
<tr>
<td>From 18-25 year</td>
<td>916 44.7</td>
<td>779</td>
<td>37.8</td>
<td>1695</td>
</tr>
<tr>
<td>From 26-35 year</td>
<td>850 41.4</td>
<td>629</td>
<td>30.5</td>
<td>1479</td>
</tr>
<tr>
<td>From 36-45 year</td>
<td>88 4.3</td>
<td>502</td>
<td>24.3</td>
<td>590</td>
</tr>
<tr>
<td>From 46 and more</td>
<td>176 8.6</td>
<td>132</td>
<td>6.4</td>
<td>308</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
<td>%</td>
</tr>
<tr>
<td>Primary</td>
<td>0 0.0</td>
<td>21</td>
<td>1.0</td>
<td>21</td>
</tr>
<tr>
<td>Preparatory</td>
<td>22 1.1</td>
<td>0</td>
<td>0.0</td>
<td>22</td>
</tr>
<tr>
<td>Secondary</td>
<td>175 8.5</td>
<td>109</td>
<td>5.3</td>
<td>284</td>
</tr>
<tr>
<td>University</td>
<td>1854 90.4</td>
<td>1933</td>
<td>93.7</td>
<td>3787</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
<td>%</td>
</tr>
<tr>
<td>Student</td>
<td>479 23.4</td>
<td>752</td>
<td>36.5</td>
<td>1231</td>
</tr>
<tr>
<td>Private Work</td>
<td>152 7.4</td>
<td>22</td>
<td>1.1</td>
<td>174</td>
</tr>
<tr>
<td>Not Working</td>
<td>352 17.2</td>
<td>88</td>
<td>4.3</td>
<td>440</td>
</tr>
<tr>
<td>Employee</td>
<td>1068 52.1</td>
<td>1201</td>
<td>58.2</td>
<td>2269</td>
</tr>
<tr>
<td>Place of Residence</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>871 42.5</td>
<td>800</td>
<td>38.8</td>
<td>1671</td>
</tr>
<tr>
<td>Urban</td>
<td>1180 57.5</td>
<td>1263</td>
<td>61.2</td>
<td>2443</td>
</tr>
</tbody>
</table>

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

Alboraeie, 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

The researchers provide special thanks and appreciation to all participants in the study whom completed the submission for their help and support.

9. References:


