Others Section

Effect of Standardised Virtual Communication on Anxiety in Relatives of Patients with COVID-19 Infection in Central Gujarat: A Prospective Interventional Study

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ABSTRACT

Introduction: There are various researches for increased anxiety in Coronavirus Disease-2019 (COVID-19) patients and their relatives due to separation, but most of them are observational. Audio-visual communication can be employed for communication between patients in rigorous isolation and their relatives. There were few researches available about the effectiveness of video calling on anxiety in COVID-19 patient. Gujarat lags considerably behind, according to bibliometric analysis of the India-based COVID-19 publication.

Aim: To determine the effect of standardised virtual communication on anxiety levels in relatives of COVID-19 intubated patient's.

Materials and Methods: This prospective interventional study was conducted at a tertiary care centre, Gujarat Medical Education and Research Society, Vadodara, Gujarat, India, from April 2021 to July 2021. Total 283 relatives of COVID-19 patient were recruited by purposive sampling. Virtual communication unit was set up, where relatives can communicate audio-visually with their patient and caregiver with help of video calling technology. Inside Intensive

Care Unit (ICU), the caregivers (intern, doctors or nurses) wearing Personal Protective Equipment (PPE) kit handled the portable audio-visual screen and answered on behalf of the patient. The Hamilton Anxiety Scale (HAS) was used to measure the anxiety of relatives before and after the communication. Paired t-test was used to statistically analyse the data. Level of significant p-value <0.05 was considered.

Results: A total of 283 subjects with 178 males and 105 female relatives were enrolled in the study. As an effect of communication, the mild anxiety prevalence decreased from 69.71% to 46.27%, the moderate anxiety prevalence decreased from 4.93% to 3.81%, and 49.92% of relatives reported being anxiety-free after communication. Statistical analysis of the paired t-test of HAS showed a drop in anxiety score after communication from 4.77 ± 3.66 to 2.88 ± 2.34 (p-value <0.001).

Conclusion: Audio-visual technology is effective as a mode of communication and counselling during a pandemic to reduce anxiety in COVID-19 victim families.

INTRODUCTION

A lot of researches are done about the increase in risks of mortality and morbidity due to Coronavirus Disease-2019 (COVID-19) [1-3]. There are foreign studies about increased anxiety in relatives and COVID-19 patients during the acute phase of the disease and its long-term effect on their mental health [4-6]. There are so many factors that can be associated with the adverse mental health of COVID-19 patient's relatives such as fear of sudden death of a patient, not being able to visit the patient, stress due to separation from the patient, higher perceived overall burden in situation due to finance, increased worries about uncertain diagnosis and infection, not enough contact with the medical team. All these factors are significantly responsible for psychosocial distress [7].

There is a study that suggests the use of video technology for face-to-face communication between junior doctors and relatives of COVID-19 patients for routine medical updates and facilitating relatives to communicate with their patients [8]. The ability of relatives to remain active in their caregiving roles virtually and rapport built with medical caregivers through video technology improves the psychological well-being of patients and their families [8]. Gujarat lags far behind in COVID-19 based publication [9].

This tertiary care centre, where the present study was undertaken, was strictly following the isolation and quarantine norms. Hospital administrator felt an urgent need for innovative methods that serve as the best alternative for routine patient-relative communication. Thus, a virtual communication unit was set near COVID-19 Intensive

Care Unit (ICU), where facility of audio-visual communication was set. The communication unit work as a virtual bridge through which the relatives were able to communicate with their patient In COVID-19 ward and ICU with help of video audio technology, without exposure to the virus. On the other hand, patient was able to see and hear relatives on the portable screen handled by a primary caregiver who was trained in Attitude, Ethics and Communication (AETCOM) modules based on need of COVID-19 patients [10-12].

The relative whose patients were admitted to ICU are found more anxious due to restricted family visiting. The fear of dying, related patient alone in ICU, and the inability of a relative to comfort his patient bedside are major contributing factors to anxiety [13]. In this intervention study, authors wanted to measure the effect of communication on the anxiety of the relatives whose specific patient was admitted less than seven days and was intubated. To make communication homogenous for all subjects, authors narrowed the broad concept of communication by standardising it. There was no study found about the effect of virtual communication on anxiety which was conducted in Gujarat state. Hence, the present study was conducted to determine the effect of virtual communication on the anxiety of a relative whose specific patient was hospitalised and isolated in a tertiary care centre, which is located in Central Gujarat.

MATERIALS AND METHODS

This prospective interventional study was conducted at a tertiary care centre, Gujarat Medical Education and Research Society Medical

College and Hospital, Vadodara, Gujarat, India, from April 2021 to July 2021 after the Institutional Ethical Clearance (IEC approval number- BHR/10/2021 which was approved on 19th March 2021).

Inclusion criteria: The immediate relatives of COVID-19 intubated patients, admitted in ICU for less than seven days were included. The status of relative was noted in relation to patient and relatives like mother, father, spouse, children, siblings were included were included in the study.

Exclusion criteria: Relatives aged less than 18 years, with history of any previous mental health disorders and denial of consent were excluded from the study.

Sample size calculation: The sample size was calculated using the following formulae $n=Z^2p(1-p)/d^2$

Where,

n is the sample size, Z is the statistic corresponding to the level of confidence, p is the expected prevalence (that is obtained from previous research), and

d is precision (corresponding to effect size) from earlier research [6,14].

Thus, in this formula where,

Z=1.96, p=20, 1-p, d=5%

The final calculated sample size was 245. Total of 283 subjects were enrolled in the study.

The sampling method was convenient-purposive sampling where author and team approached the study population who came to use a virtual communication facility to talk with their patient. The author and team informed relatives about the present study, asked for consent and screened relatives for inclusion criteria.

Study Procedure

Data collection was done at a communication and counselling centre. The virtual communication unit was set-up under the administration of this already running communication and counselling centre.

Hamilton Anxiety Scale (HAM-A): The suitable subjects were screened for anxiety using the Hamilton Anxiety Scale for assessment of anxiety before and after virtual communication which took about 15 to 20 minutes [15-17]. The Hamilton anxiety scale (HAM-A) is one of the first rating scales which were developed to measure the severity of anxiety levels, available in public domain, and is still widely used even today in both clinical and research. It is made of 14 symptom-defined elements- anxious mood, tension, fear, insomnia, intellectual, depressed mood, somatic (muscular/sensory), cardiovascular symptoms, respiratory symptoms, gastrointestinal symptoms, genitourinary symptoms, autonomic symptoms and behaviour at interview (psychological and somatic) comprising anxious mood, tension, startle response, fatigability, restlessness, fears of dark/strangers/crowds, insomnia, intellectual problems like poor memory/difficulty concentrating, depressed mood.

- Physical somatic symptoms include aches and pains, stiffness, bruxism.
- Physical sensory symptoms including tinnitus, blurred vision.
- Other domains of somatic system screened like respiratory (chest tightness, choking); cardiovascular (including tachycardia and palpitations); gastrointestinal (including irritable bowel syndrome-type symptoms); genitourinary (including urinary frequency, impotency); autonomic (including dry mouth).

For every question, score on scale of:

- 0=not present,
- 1=mild,
- 2=moderate,
- 3=severe,
- 4=very severe was given as an answer option.

In Hamilton Anxiety Scale, if total

- Score 0 means no anxiety,
- Score <17 indicates mild anxiety,
- Score 18-24 mild to moderate anxiety,
- Score 25-30 moderate to severe and
- Score 31 to 56 severe anxiety.

[Annexure 1] is showing the HAS questionnaire.

Standardised Virtual Communication (SVC): After initial screening for anxiety, relative entered the virtual communication unit. A virtual communication centre with help of audio video; input and output technology facilitated the communication between relative and particular patient. The caregiver moved the portable audio-visual unit in front of patient, where relatives and patient both parties could comfortably see each other and listen. After the completion of virtual communication relative exit the out unit and immediately approached by the author and team for post-SVC anxiety assessment.

To overcome the challenges during video calling the caregivers were given training in attitude, ethics and communication modules based on COVID-19 disease. This new curriculum includes attitude, ethical and communication training compulsory for all students [10-12]. Based on those modules, at the counselling and communication centre, the intern doctors and paramedical staff were given training.

It was focused on effective domains like:

- What is to be a COVID-19 patient?
- What is to be relative of COVID-19 infected patient?
- How to break bad news to patient's relatives?
- Remodelled and structured according to specific COVID-19 pandemic scenarios. Specific written guidelines of Do's and Don't check lists before starting Standardised Virtual Communication (SVC) were given to caregivers [10-12].

STATISTICAL ANALYSIS

In present study Prism-GraphPad version 8.0 was used for statistical analysis. Paired t-test was used to statistically analyse the data. Level of significant p-value <0.05 was considered.

RESULTS

The [Table/Fig-1] shows the relation, gender and age distribution in study subjects. A total of 283 subjects were included in the present study out of the 178 were males and 105 were females. Further demographic distribution of subjects whose recruitment was based on relation to the specific patient was 130 sons, 32 brothers, 12 fathers, four husbands, 43 daughters, 16 sisters, 15 mothers and 31 wives.

Relatives distribution (gender)	Relation to the patient	Age mean (years)	n, %	Pre SVC-HAM-A score	Post SVC-HAM-A scores	p-value
Males (n=178)	Son	31.89± 11.51	130 (45.93%)	4.756± 2.705	3.77± 2.686	1.644
	Brother	39.27± 15.31	32 (11.30%)	4.722± 2.833	2.762± 1.855	**0.02**
	Father	57.01± 12.76	12 (4.24%)	4.182± 2.273	2.639± 3.331	**0.02**
	Husband	53.92± 10.12	4 (1.41%)	4.875± 3.188	3.81±2.81	**0.005**
Females (n=105)	Daughter	29.41± 6.62	43 (15.19%)	5.654± 6.038	5.381± 4.66	**0.007**
	Sister	38.24± 9.39	16 (5.65%)	2.8±2.38	2.3± 2.36	**0.01**
	Mother	55.62± 9.26	15 (5.30%)	5.273± 3.636	4.692± 3.009	**0.02**
	Wife	51.71± 12.51	31 (10.95%)	4.471± 2.824	3.362± 2.007	**0.005**

[Table/Fig-1]: Demography of study population showing (age-sex) relation based distribution (N=283).
Paired t-test; level of significant p-value <0.05

There was a significant decrease in the HAM score after audio-visual communication (2.88±2.34) than before the communication (4.77±3.66) (p-value <0.001) [Table/Fig-2].

Group	Pre SVC-HAM-A	Post SVC-HAM-A	p-value
Mean±SD	4.77±3.66	2.88±2.34	<0.001
Standard Error of Mean (SEM)	0.22	0.14	

[Table/Fig-2]: Comparison of Hamilton anxiety scale in pre and post standardised Virtual Communication (SVC) (N=283).
Paired t-test; level of significant p-value <0.05

Analysis of HAS before and after communication showed that prevalence of anxiety has decreased post communication, the mild to moderate anxiety prevalence decreased from 197 (69.71%) to 131 (46.27%), moderate to severe anxiety prevalence decreased from 14 (4.93%) to 11 (3.81%) [Table/Fig-3].

Prevalence of anxiety based on HAMA score HAM-A	Pretest number (%)	Post-test number (%)
0 (no anxiety)	72 (25.44%)	141 (49.82%)
1 to 17 (mild to moderate anxiety)	197 (69.61%)	131 (46.29%)
≥18 (moderate to severe anxiety)	14 (4.95%)	11 (3.89%)

[Table/Fig-3]: Prevalence of anxiety in pre and post standardised virtual communication.

DISCUSSION

Since 2019, the globe has been fighting a novel coronavirus, and scientific study and literature about the epidemic are critical to victory. Researchers have published in the areas of causation, clinical characteristics, and vaccine development, resulting in a significant increase in the amount of scholarly literature on COVID-19 [9]. The authors during an intensive literature review found that India is far behind the United States of America, China, United Kingdom and Italy [18-20]. A meta-analysis of the global prevalence of anxiety and depression shows publication ratio of China:India is 7:2 indicating ignored mental health aspects of COVID-19 in the Indian background [19].

The researchers stated that the research work done done on the mental health of relatives is less than compared of patients and frontline health workers [21]. Recent evidence suggests that individuals who are kept in isolation and quarantine have negative effects on mental health such as stress, anxiety, frustration, anger, fear and confusion [20].

The higher prevalence of anxiety in relatives may be due to the acute phase of disease or hospitalisation [4,5]. There are so many factors that can be causing anxiety and stress in relatives such as stress due to isolation measures and separation from the patient, not being able to visit the patient, fear of death of a patient, higher perceived overall burden on the situation, increased worries about uncertain diagnosis and infection, not enough contact with the medical team, missing physical touch [7]. The most violated domain and contributing factor in anxiety was the affective domain i.e, the emotional needs of the family. In these studies, video calling was implemented in the COVID-19 unit with some attempts of standardisation, but the training of healthcare personnel to meet the affection needs of COVID-19 affected families was not done. All of these factors discussed earlier can be removed by virtual communication except physical touch [22-25]. A qualitative study was done by a researcher in Italy, where he conducted an in-depth interview of respiratory therapists who used video calling for communicating with relatives confirmed the positive impact of video calling on patients and relatives both, but also the need for training to cope with psychological challenges during communication [25]. Family dynamics were shattered during the COVID-19 pandemic scenario because of isolation and restricted visits [26]. All these factors can lead to Post Traumatic Stress Disorder (PTSD) in the future which is a highly occurring relative of COVID-19 [27]. The guilt

of not being able to visit, and take care of the patient often is a major contributor to PTSD. The fear of patients dying alone is major stress and grief inducer in relatives [27-29].

Authors made COVID-19 specific AETCOM training modules with help of Institutional experts, scientific discussion and feedback from every healthcare level, in which caregivers were specially trained to cope with challenges during virtual communication which were based on the following list of affective aspects:

- Relative wanted to be near their patient during hospitalisation and especially in the patient's end time.
- Relatives wanted to express their feelings to nursing and medical staff and want to feel accepted by them.
- They want to feel that the staff is concerned about their patient.
- They want to receive the appropriate education or information to help their patient in the hospital.

The most ethically challenging sensitive issue was relatives always wanted to feel that there is hope for the patient's recovery because in very morbid patients, doctors had to break the bad news of the "probable end time of patient's life and all relatives should say goodbye". Thus, providing an on-site (just nearby ICU where loved ones are admitted) standardised virtual communication unit where relatives can sit comfortably see and talk with their patient, where the primary care giver was present by their patient side must be fulfilling their emotional needs. Especially covering the affective domain in communication might be the core of all interrelated factors which decreased post communication anxiety scores. Studies show that the opportunity for meaningful communication prior to death maybe even more important than being all-time present [30]. A study suggests that well-maintained updated communication between caregivers and family establishes good rapport and trust [8]. Thus, having good communication with patients mediated by the primary caregiver and a sense of having talked before imminent tragedy may be a reason of post communication stress relief in family members [8,31,32].

Also, the advantage of non verbal communication provided by virtual communication cannot be overlooked, where relatives can see the body language, and eye contact of the primary caregiver. The presence of a doctor at the bedside of the patient for a long time is a good attitude and communication factor which might also help reduce the anxiety of relatives [31-33]. This implementation of standardised virtual communication which has to be molded according to the needs of the field and patients can be helpful to physiotherapists, nursing staff, psychologists and other allied health professionals in their COVID-19 patient care, senior citizen care and patients with mobility issues. The specific guidelines sensitisation regarding this should be done in advance [34]. In the case of the 3rd wave of COVID-19, structured guidelines and resources should be available for the implementation of virtual communication at the secondary and tertiary care centre level. Standardised communication guidelines for relatives (soft copy via SMS or WhatsApp) that outline protocol in local Gujarati/ Hindi/English language should be distributed to patient's relatives on admission. The purpose of this standardised guideline is, to help relative to align their expectations, limitation and maintain a structured approach to communication. The specific arrangement for communication unit duty allotment and COVID-19 AETCOM sensitisation should be done in advance at secondary and tertiary care centres to prepare in advance. But precaution needs to be taken while using video technology to avoid in house contamination. One major fear is, cross-infection to the staff and other patients because of contamination of devices because Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) is viable for up to three days on the surfaces of electronic devices [35]. Measures were taken to prevent this was the use of disposable plastic sleeves to cover the device with each use, a specific allotment to one person for communication duty who wears a Personal Protective Equipment (PPE) kit and did not touch any other surfaces and patient except for communication devices and regular alcohol sanitisation of all surfaces [36,37].

Limitation(s)

The scope of the study is limited since the sample is entirely from one Institution (single Institutional involvement). One major fear was cross-infection to the staff and other patients because of contamination of devices. Patient anxiety scale was not recorded. The self-reported bias as for anxiety the screening was only applied (not diagnosed by the clinician).

CONCLUSION(S)

The positive effect of standardised virtual communication which is measurable in terms of anxiety scale and prevalence. The actual implementation of theoretical aspects of attitude, ethics and communication principles in COVID-19 pandemic scenario. First kind of interventional study COVID-19 mental health aspects in central Gujarat. The universal implication of this both tools can be effective in reducing anxiety, depression and PTSD in COVID-19 victim families, reducing the community and national health burdens. Further studies could be aimed to implement and study its effect on various need-specific AETCOM modules in scenarios where the doctor-patient relationship is most challenged and planning for a cohort, where we can measure its implication in the longer run.

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ANNEXURE-1:
Hamilton anxiety rating scale

Hamilton Anxiety Rating Scale (HAM-A)

Below is a list of phrases that describe certain feeling that people have. Rate the patients by finding the answer which best describes the extent to which he/she has these conditions. Select one of(5) the five responses for each of the fourteen questions.

0 = Not present,   I = Mild,   2 = Moderate,   3 = Severe,   4 = Very severe.

I Anxious mood   [0] [1] [2] [3] [4]

Worries, anticipation of the worst, fearful anticipation, irritability.

2 Tension   [0] [1] [2] [3] [4]

Feelings of tension, fatigability, startle response, moved to tears easily, trembling, feelings of restlessness, inability to relax.

3 Fears   [0] [1] [2] [3] [4]

Of dark, of strangers, of being left alone, of animals, of traffic, of crowds.

4 Insomnia   [0] [1] [2] [3] [4]

Difficulty in falling asleep, broken sleep, unsatisfying sleep and fatigue on waking, dreams, nightmares, night terrors.

5 Intellectual   [0] [1] [2] [3] [4]

Difficulty in concentration, poor memory.

6 Depressed mood   [0] [1] [2] [3] [4]

Loss of interest, lack of pleasure in hobbies, depression, early waking, diurnal swing.

7 Somatic (muscular)   [0] [1] [2] [3] [4]

Pains and aches, twitching, stiffness, myoclonic jerks, grinding of teeth, unsteady voice, increased muscular tone.

8 Somatic (sensory)   [0] [1] [2] [3] [4]

Tinnitus, blurring of vision, hot and cold flushes, feelings of weakness, pricking sensation.

9 Cardiovascular symptoms   [0] [1] [2] [3] [4]

Tachycardia, palpitations, pain in chest, throbbing of vessels, fainting feelings, missing beat.

10 Respiratory symptoms   [0] [1] [2] [3] [4]

Pressure or constriction in chest, choking feelings, sighing, dyspnea.

11 Gastrointestinal symptoms   [0] [1] [2] [3] [4]

Difficulty in swallowing, wind abdominal pain, burning sensations, abdominal fullness, nausea, vomiting, borborygmi, looseness of bowels, loss of weight, constipation.

12 Genitourinary symptoms   [0] [1] [2] [3] [4]

Frequency of micturition, urgency of micturition, amenorrhea, menorrhagia, development of frigidity, premature ejaculation, loss of libido, impotence.

13 Autonomic symptoms   [0] [1] [2] [3] [4]

Dry mouth, flushing, pallor, tendency to sweat, giddiness, tension headache, raising of hair.

14 Behavior at interview   [0] [1] [2] [3] [4]

Fidgeting, restlessness or pacing, tremor of hands, furrowed brow, strained face, sighing or rapid respiration, facial pallor, swallowing, etc.