Role of Sound Enhancer Device in Teleconsultation

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ABSTRACT

Aim
To study the role of sound enhancer device in teleconsultation.

Methods
This study was conducted in the plastic surgery department in a tertiary care centre in the month of May-June 2019. A sound enhancer device was used with mobile phone for videoconferencing as form of teleconsultation by plastic surgery trainees in operation theatre and outpatient department. At the end of the study feedbacks were taken from the trainees.

Results
It was found that on using the sound enhancer device, the sound quality improved and it was helpful in the teleconsultation sessions using videoconferencing.

Conclusion
The use of sound enhancer is a simple, cost-effective, innovative method of using a simple technology to aid in utilisation of teleconsultation facilities in a very non-sophisticated way.

Keywords
Sound enhancer device; Teleconsultation; Telemedicine.

INTRODUCTION

Telemedicine is the remote delivery of healthcare services, such as health assessments and consultations, over the telecommunication infrastructure. Telemedicine helps healthcare workers in evaluating, diagnosing and treating patients who are at a remote place. With the advent of telemedicine it has been possible to save time by teleconsulting for minor ailments. Recent advancements in communication technologies has made it possible to use simple technologies such as videoconferencing and smart phones without the need for an in person visit. Telemedicine's role has grown as more and more people are seeking healthcare at a low cost. In this study, we describe the use of a simple device in the form of a sound enhancer with mobile phone videoconferencing as part of teleconsultation. Videoconferencing through mobile phones has been long in place but sound is not usually clear and loud in spite of keeping the device in maximum volume mode. To enhance the sound external power run speakers are used but an innovative indigenous method of enhancing sound without use of electricity is described here.

MATERIALS AND METHODS

This study was conducted in the plastic surgery department in a tertiary care centre in the month of May-June 2019. Informed consent was taken from all the participants. A sound enhancer device (Figure 1) made of bamboo was used as part of telemedicine in the form of teleconsultation from consultants and specialists who are at remote places and their advice was used by means of videoconferencing by mobile phone device in operation theatre and in outpatient departments by 6 plastic surgery trainees in theirlearn-
ing curriculum. Cases were discussed and doubts were cleared and
advises were given regarding the further management of the pa-
tient depending on the case discussed. Feedbacks were taken from
the 6 plastic surgery trainees regarding the use of sound enhancer
in teleconsultation. The sound enhancer was made up of indige-
nous material like bamboo; it has a docking station for holding the
mobile phone and two hollow speakers bilaterally on both ends.
The mobile phone device is mounted over the docking station and
the sound is amplified by the speakers and perceived by the recipi-
ents. The sound enhancer for videoconferencing was utilised at the
time of surgery in the operation theatre (Figure 2) and also in the
outpatient department.

RESULTS

On the analysis of the feedback form (Table 1) it was found that
the use of bamboo sound enhancer during videoconferencing with
mobile phone as means of teleconsultation was found to be ef-
fective with respect to quality of sound, enabling one to listen to
the distant faculty and consult with them regarding the cases both
intraoperatively and in outpatient department.

DISCUSSION

Telemedicine, a term coined in the 1970s, which literally means
“healing at a distance”,1 signifies the use of information and com-
munication technology (ICT) to improve patient outcomes by in-
creasing access to care and medical information. Four elements
are germane to telemedicine: 1. Its purpose is to provide clinical
support. 2. It is useful in overcoming barriers due to distance and
connecting users who are in different physical locations. 3. It in-
volves the use of various types of Information and communica-
tion technologies. 4. Its goal is to improve health outcomes. Recent
advancements in, and increasing availability and utilization of, ICTs
by the general population have been the biggest drivers of tele-
medicine over the past decade, rapidly creating new possibilities for
health care service and delivery. This has been true for developing
countries and underserved areas of industrialized nations.2 With
the advent of low cost digital communication, there is increase in
the interest in the application of telemedicine among health-care
providers, and have enabled health care organizations to envision
and implement new and more efficient ways of providing care.3,4
As internet has become more popular it has aided in ICT advance-
ments, thereby expanding the scope of telemedicine to encompass
web-based applications (e.g. e-mail, teleconsultations and conferenc-
ies via the internet) and multimedia approaches (e.g. digital imagery
and video). These advancements have led to creation of newer
telemedicine applications that the world is coming to use. Tele-
medicine is helpful in those situations where the healthcare worker
on duty has little or no access to expert help5; it is able to offer re-
mote physician access to otherwise unavailable specialist opinions,6
providing reassurance to both doctors and patients. Telemedicine
programmes have been shown to directly and indirectly decrease
the number of referrals to off-site facilities and reduce the need
for patient transfers.7,8 Telemedicine creates a university without
borders that fosters academic growth and independence because
the local participating surgeons have direct access to experts in the
developed world. The knowledge sharing that has occurred has
shown to aid health-care professionals in overcoming the profes-
sional isolation that they often face in remote areas, and to improve
their skills and the services they offer.9

We describe our experience with the use of bamboo en-
hancer in teleconsultation. The sound enhancer acts as amplifier as
well as stand for the phone. It is light weight and portable, easy to
transport and no cords or cables or batteries required. The hand-

Table 1. Describes the Feedback form Obtained from 6 Plastic Surgery Trainees

<table>
<thead>
<tr>
<th>Question</th>
<th>Trainee 1</th>
<th>Trainee 2</th>
<th>Trainee 3</th>
<th>Trainee 4</th>
<th>Trainee 5</th>
<th>Trainee 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Was the quality of sound enhanced with the use of the enhancer?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>2. Were you able to clearly listen to the distant faculty and clarify your doubts?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>3. Did this aid in enhancing your teleconsultation experience?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>4. Did you find any drawbacks?</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>5. Would you recommend this device and its utility to your peers?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
made sound enhancer enables one to share sound through passive sound amplification. It is incredibly durable, renewable and rich in tonal variation. The sound enhancer is made from eco-friendly and sustainable bamboo. Its 100% green and uses no electricity. It can be used for hands-free calls and Skype. It has an anti-tilting inclined stand and precise mobile slot for minimum leakage. It is cost effective from prices ranging from 350 INR to 550 INR. Teleconferencing and video-conferencing can be done with enhanced sound using mobile phone and bamboo sound enhancer. This mode of telecommunication and telemedicine helps doctors in teleconsulting with remote faculties without the use of sophisticated technologies. There are certain limitations to the use of bamboo sound enhancer such as use in a noisy room may impair its sound clarity and loudness. Usually it can be used in phones with bottom speakers only and part of the mobile screen may not be visible after keeping the mobile on the stand, hence it may not provide very good video clarity compared to sound enhancement.

CONCLUSION

The use of sound enhancer device made of bamboo is sustainable, cost-effective and simple method for aiding mobile phone videoconferencing for teleconsultation with specialists and remote faculties thus achieving an innovative method of enhancing the teleconsultation experience. The anticipated limitation of the study is that there is no control conditions to compare it with the use of no amplification system. The huge limitation of the study is that there is no control conditions to compare it with the use of no amplification system. The present study is a preliminary study and it requires randomised controlled multicentric trials with statistical analysis to further substantiate the role of bamboo sound enhancer in teleconsultation.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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