CHAPTER -1

Introduction
INTRODUCTION

“Voice is ephemeral and many factors support it, influence it, and affect perceptions of it.”


Importance of human voice in modern society cannot be overstated. It is the primary instrument through which most of us project our personalities and influence our compatriots. Human voice is an important tool in many professions in the present day. Besides normal day to day communication, voice is also used for professional purposes by singers, actors, radio/TV artists, lawyers, teachers, sales-persons. They are referred to as “professional/occupational voice users”, as their voice is primarily used as a means of income and livelihood. They are dependent on vocal endurance and quality for their livelihood. They are referred to as “Olympic athletes” of the voice world. Thus, they provide exciting challenges and special responsibilities for physicians and other voice related health care professionals (Sataloff, 1991). A clear, pleasant, and well-functioning voice is a prerequisite for a professional voice user (Verdolini & Ramig, 2001; Vilkman, 2004; Casper, 2001). Since voice is an occupational tool in professional voice users, any voice problems can negatively affect their job performance (Sataloff, 1991). Thus, voice care and cure in professional voice users have gradually been developing into important safety and health issues since the beginning of 20th century. As reported by Carding (2007), the UK Industrial Injuries Advisory Council (IIAC), initiated the process of collecting evidence between voice disorders and particular types of work. Its aims were to examine the issues of occupational voice disorders and decide on disablement benefit to be paid to appropriate cases. Clinical features of voice disorders are not uniquely occupational and hence face the disadvantage of being considered as occupational. IIAC has indicated the need for further studies to address the standard
definition of occupational voice disorders and consensus on the methods of measurement in relation to both the disorder and exposure. This is to prove that, there is a doubling of risk in occupations with particular levels of exposure likely to result in vocal disorders.

No single definition for voice problems has been agreed upon. According to Ma and Yiu (2001), voice problem is a multidimensional phenomenon that usually includes a self-perceived reduction in physical, social, emotional and professional wellbeing. That is, they considered ‘dysphonia’ as a problem only if it causes discomfort or interferes in some way with the lifestyle of an individual. According to Aronson (1980), a voice disorder exists, ‘when quality, pitch, loudness or flexibility differs from the voice of others of similar age, sex, and cultural group’. Verdolini and Ramig (2001) stated that, voice problems may represent an array of self-reported symptoms and clinically observed signs. They defined voice disorders as “a condition of sufficient concern for the bearer to report it, register functional disruption because of it, and/or seek treatment because of it”.

Phonation may be affected by several factors such as deviant body posture, imbalanced use of muscles, behaviour towards the voice (e.g., smoking and shouting), emotional disturbances and gastro-oesophageal reflux (Morrison & Ramage, 1993); lack of voice training (Simberg, Laine, Sala & Ronnemaa, 2000); psychological stress (Roy & Bless, 2000); excessive use, misuse or abuse of the vocal mechanism (Sapir, Attias & Shahar, 1990). Most of the voice disorders and laryngeal pathologies may have contributions from any one or more of the etiologic factors with considerable overlap among these groupings and may result in acute or chronic symptoms of vocal attrition (Aronson, 1980; Sapir et al., 1990). Even though professional voice users are susceptible to develop all types of laryngeal pathologies,
the functional pathologies are most likely to occur because of improper or excessive use of voice (Stemple, Glaze & Gerdemann, 2000).

About one-third of the workforce in modern economies relies on their voice to do their job, spanning teachers to trade unionists, call centre workers to checkout staff (Sataloff, 1991). The vocal demands imposed on each type of professional vary from profession to profession (Hoffman-Ruddy, Lehman, Crandell, Ingram & Sapienza, 2001). A positive association between voice problems and vocally demanding jobs are reported in the literature, say teaching (Sapir, Keider & Mathers-Schmidt, 1993; Smith, Gray, Dove, Kirchner & Heras, 1997; Smith, Lemke, Taylor, Kirchner, & Hoffman, 1998b; Russell, Oates, & Greenwood, 1998), singing (Sapir, 1993; Miller & Verdolini, 1995; Sapir, Mathers-Schmidt & Larson, 1996), and aerobic instructions (Long, Williford, Olson & Wolfe, 1998). Research in the late 20th century indicates that the proportion of professional voice users suffering from voice problems, at least a few times a year varies from 20 to 80% (Russell et al., 1998; Pekkarinen, Himberg & Penti, 1992). Higher prevalence of voice problems among the occupational voice users could have a negative impact on society (Rantala, Vilkman & Bloigu, 2002) as extensive use of sick benefits, workers’ compensation claims and employment of temporary staff in the public sectors (Sprigg, Smith & Jackson, 2003). The effects of a voice disorder depend on the voicing needs of the individual. Those with a greater need for normal voice production may be unusually concerned with the presence of even subtle vocal difficulties, whereas those with low vocal needs may not be concerned with even more severe vocal problems. Thus, identifying the vocal needs of each individual is extremely important in successfully treating voice disorders (Koufman & Isacsson, 1991). Hence, while defining the nature of voice problems in professional voice users, it is necessary to consider the nature of...
the voice symptoms reported by them and the impact of those symptoms on work and social interaction (Jones, Sigmon, Hock, Nelson, Sullivan & Ogren, 2002). As the service sector continues to grow, more and more personnel are depending on their voice to earn their living; the impact of "repetitive voice injury" on workers and the economy could be enormous. This brings us to the concern of early identification and treatment of voice problems in professional voice users in order to reduce their severity, impact and the time needed for recovery (www.hazards.org/voiceloss/workhoarse.htm).

As voice problem is a complex multidimensional phenomenon; it includes a self-perceived reduction in physical, social, emotional and professional wellbeing. Hence, it is difficult to quantify the amount of vocal dysfunction on an individual’s quality of life (Hogikyan & Sethuraman, 1999). Although acoustic and auditory perceptual measures of voice are found to be very useful in establishing voice quality impairment, the agreement between acoustic measures and audio-perceptual ratings of voice quality remains inconsistent (Stemple et al., 2000). Questionnaires have been reported to be economical and useful to collect data about self perceived voice problems (Mattiske, Oates & Greenwood, 1998; Russell et al., 1998; Sala, Laine, Simberg, Pentti & Suonppa, 2001). The task of establishing a self perceived voice problem may be challenging because it does not correlate with the degree of voice quality impairment measured acoustically or identified perceptually (Ma & Yiu, 2001). Behrman, Sulica and He (2004) stated that, self-assessment measures provide information regarding vocal function from the patient’s perspective, particularly regarding quality of life changes imposed by the dysphonic condition. Further, it has been reported that as with many health-related problems, patients with similar laryngeal dysfunction, according to medical criteria, can perceive the severity of the resulting dysphonia dissimilarly,
experiencing a range of handicaps. Communicative requirement and expectations about how one’s voice should sound and perform vary considerably among individuals, influencing perception of vocal handicap in a complex fashion that is not easily predicted from factors in patient history or findings of the clinical examination. It has also been stated that certain factors might reasonably be expected to predict level of perceived vocal handicap (Behrman et al., 2004); age, sex, lesion type, phonatory glottal closure, mucosal wave vibration, auditory perceptual assessment of dysphonia severity and harmonic to noise ratio are weak predictors of Voice Handicap Index scores. Thus, the self perception of dysphonic severity being independent of commonly assessed factors, voice problems have been recommended to be interpreted based on self reported symptoms and clinically observed signs (Verdolini & Ramig, 2001).

Most of the studies on occupational voice problems have focused on teachers’ voices as they constitute one of the largest professional groups depending on their voice (Fritzell, 1996; Mattiske et al., 1998; Sala et al., 2001; Titze, Lemke & Montequin, 1997; Russell et al., 1998; Ohlsson, Järvholm, Löfqvist, Näslund & Stenborg, 1987; Sodersten, Granqvist, Hammarberg & Szabo, 2002). Recent research in professional voice users, however points out that people working in call center industry are facing the threat of losing their voices (Jones et al., 2002; Vowels, 2004; Lehto, Rantala, Vilkman, Alku & Backstrom, 2003, Taylor & Oates, 2004). The problem, earlier known as ‘teacher’s syndrome’ is now as per Carding (2005) reported often in the young call center employees, some of whom could face its acute manifestation as permanent loss of voice. In addition increasing numbers of call center workers are being referred to speech therapists for loss of voices. The report also indicates an
increasing evidence of people taking time off and losing their jobs due to frequent voice problems. This has gathered a new terminology, ‘call centeritis’.

1.1 Call Centers

Call centers/centres are locations where workers sit at computer terminals answering telephone calls on their employers business. They work through computer programs to answer the caller’s questions, take orders, record details etc. The term “call centre” has been variously defined in the literature. According to Sprigg et al., (2003), a call centre has been defined as “a work environment in which the main business is conducted via a telephone whilst simultaneously using display screen equipment (DSE).” Further, a Call handler (also known as Call Center Operator/Customer service advisor/Agent) is “an employee whose job requires spending a significant proportion of their working time responding to calls on the telephone whilst simultaneously using DSE”. To enable effective interaction i.e., to operate a computer and listen and talk to the callers at the same time, call center workers wear headsets. Call center operators’ (here after referred to as CCOs) work has become progressively more computerized over the last few decades. Computer-telephone interactive tasks, as performed in call centers are very special tasks, as video display units are used interactively during telephone calls. This necessitates repetitive movements and prolonged static sitting postures. According to Batt, Doellgast, Kwon, Nopany, Nopany and Costa (2005) they are also required to meet targeted number of calls, sometimes with absolutely no space between each call. This has resulted in some centers having a screen showing the rate of calls being processed, identifying slower workers to their challenges, and pushing for more work.
Call centers can be broadly classified as International (serving international market) and Domestic (serving domestic market). Services performed by call centers vary considerably. While some centers handle customer service inquiries only and are called as inbound call centers (such as loan processing, billing, or collections), others primarily handle sales by placing calls to potential customers mostly with intention of selling, and are called as outbound call centers (the majority are outbound sales or telemarketing). Others handle both service enquiries and sales, and a fourth category offers IT help or technical services. Typical services with outgoing calls are advertising campaigns, market research and selling by telephone. Examples of activities with incoming calls are customer services, giving information, taking orders and providing helpdesk functions.

Call center staff are often organized into a multi-tier support system. Internet reports (http://www.webindia123.com/career/options/call/intro.htm) stated that, the first tier consists of operators, who provide general directory information. If a caller requires more assistance, the call is forwarded to the second tier, where most of the issues could be resolved. In some cases, if a caller requires more assistance, he is forwarded to the third tier support; typically, third tier support involves product engineers or highly skilled staff of the product.

According to the reports of Batt et al., (2005) the dramatic growth of the call center industry is a world-wide phenomenon, fuelled by advances in information technologies and the precipitous decline in the costs of voice and data transmission over the last two decades. The Indian call center industry has its roots in the mid – 1990s when companies such as American Express, British Airways and GE Capital established their own operations for customer support and transaction processing services. These were, however, not interactive
call centers. In the late 1990s, GE established its first voice operations, followed by the growth in third party outsource and the industry boomed during 1999-2000. Since then, the call center industry has expanded rapidly year after year. Even though the call centers arrived in India recently, the industry has grown substantially and become integral part of the export-oriented IT software and services and now become a broad based business platform backed by leading Indian IT software and services organisations and third party service providers. The report further states that India’s call center industry accounts for a quarter of the software and service exports from the country. Indian companies are offering a variety of outsourced services such as customer care, billing services, database marketing, Web sales/marketing, accounting, tax processing, transcription, transaction document management, telesales/telemarketing, HR hiring and biotech research, etc., These industries in India, staffed by English speaking workers mainly serve clients based in the United States along with United Kingdom, Australia etc. Hence, to meet the needs of foreign clients, the industry trains its native youth to adopt American accent and corporate culture to enhance customer care (Basu, 2004). A recent report by Swati (2009) indicates that majority (65%) of the call center jobs in India are to help overseas customers (outbound calls). Outsourcing call center jobs to India saves a lot of money for these foreign companies because of difference in labour costs. For Indian youth, call center jobs do not require advanced degrees but still pay well when compared to other kinds of jobs and hence are quite appealing. Typically in a BPO, a day is divided into three eight hour shifts with night shift being utilized the most (60%). Each employee has a target of attending 150 calls per day of overseas customers. According to the reports of Nasscom (2003), calculating precise number of call center employees in the industry is difficult as the call centers are grouped under broader category of ITES - BPO
(Information Technology Enabled Services – Business Process Outsourcing), a formulation which encompasses a host of non-customer facing, back-office clerical and administrative operations. Another reason is that, in three-quarters of premises, combination of voice service and back-office work routinely occurs. Disentangling call center from overall ITES-BPO data, Nasscom in 2003 identified around 75,000 to 115,000 call center workers employed in India. According to the reports of Khalil, Dongier, Zhen-Wei Qiang (2009), in India, women make 30% of the call center workforce and are expected to grow to 45% by 2010. In India, according to Choudhary, Sapur and Deb (2002) the male and female employee ratio is 7:3, unlike in western world, where females outnumber males.

1.2 Health problems in call center operators

In the late 1990s, with the rise in the number of call centers across the world, researchers began to investigate factors specific to their working environment that could affect workers’ health. Studies involving a large number of workers and call centers were conducted in Europe. The first study in UK, commissioned by the Health and Safety Executive (HSE), investigated a sample of some 3,000 CCOs employed at 36 Call Centers (Sprigg et al., 2003). The study revealed that CCOs were at a greater risk of psychological distress and had lower levels of satisfaction compared to workers in other jobs. The high stress levels reported by call handlers were attributed to excessive workloads, conflicting work requirement, unclear work roles and responsibilities, and not being required to make full use of their skills.

Another study was conducted in Sweden, by the National Institute for Working Life, involving approximately 1,200 workers from 28 call centers (Norman, Wigaesus &
Toomingas, 2008a). The study aimed at comparing the health related problems between CCOs and video display terminal users. In their study, the call center workers reported more adverse ergonomic conditions, less supervisory support and limited opportunities to manage their work. They were more likely to report health problems (headache, pain in the neck and shoulders) and be on medication.

Norman, Floderus, Hagman, Toomingas and Tornqvist, (2008b) studied the health problems between in-house and outsourced CCOs. Upon comparison between in-house and outsourced CCOs, the outsourced CCOs were found to be at greater risk of musculoskeletal health problems. The discriminating factor was apparently the higher number of calls handled by outsourced CCOs. Factors namely, comfort of the work environment, low complexity of work, long total time of customer call for day, continuous computer work, high psychological demand, low decision latitude, lack of social support from colleagues and supervisors were associated with symptoms in the neck/shoulder and arm/hand.

Another common problem encountered by CCOs is the pace of work. A forced pace of work requires the CCOs to meet the targeted number of calls, with no gap in between each call. As per LHC (London Hazards Center) Fact Sheet (May, 2001), some call centers even have a display screen showing the rate of calls being processed by individual employee, and some others have computer programs that push for more work to be done by displaying messages on individual worker’s screens. This type of forced work as per the Fact Sheet puts the CCO under more stress, repetitive strain injuries (RSI) and other ill health. The occupational medicine defines RSI as ‘overload of repetitive movements and static and
dynamic muscle loading combined with biomechanical, ergonomic and psychological factors as well as poor treatment of early symptoms' (Dalton & Hazleman, 1987).

In addition to musculoskeletal problems, literature has reported other common health problems for this group of workers, particularly problems related to voice, psychological stress, such as anxiety, insomnia and depression (Jones et al., 2002; Ferreira & Saldiva, 2002; Lehto et al., 2003 & Halford & Harvey, 2003). As the call center wages are attractive, more and more youngsters are joining this profession. These employees are bound to use their voice excessively in view of their job demand. It is reported that, these workers abuse their voice to compete with the working area noise. Hence, they are more susceptible to develop organic voice changes (Jones et al., 2002; Lehto et al., 2003). Voice therapists in United Kingdom report that voice problems in call center operators are seen in large proportions with many of them are losing their voices to an extent that they no longer hold their jobs. These CCOs literally push their voices to the limit, giving little time for their voice boxes to get back to normal (BBC News UK edition, 2004) and suffered from repetitive voice injury (Carding, 2005). Cameron (2000) described the demands of call center work environment as being emotional, cognitive, and vocal. He also reported that, training call center operators focused on vocal styling and not skilling their jobs.

In India, the call center employee exit and burnout occur in extremes when compared to UK or US call center employees (Taylor & Bain, 2005). Certain distinctive characteristics of the Indian industry exacerbate these generic problems. Firstly, it is the ten hour time difference between USA and India. Almost all Indian office operations have to work at shifts typically running from 5.00 p.m. to 3.00 a.m. to coincide with the day office hours in the
United States. Working at this time requires adjusting one’s biological clock and social routines to a different time, which could be a major cause of health related and social problems in Indian CCO’s (Basu, 2004). Secondly, although the built environment of the Indian call center industry bears favourable comparison with foreign companies, the sealed buildings, lack of fresh air, and artificially created micro-climates (temperature, air conditioning and humidity levels) make the employees to develop more health related problems. Health related symptoms are exacerbated by the extremes of temperature and humidity during monsoons in India, which the Building Management System (BMS) will be unable to counteract, particularly in circumstances of 24-hour building occupancy (Nasscom, 2003). Thirdly, language, accent and cultural training are the central priorities in Indian call centers. Hence, there is an almost universal compulsion to adopt westernized pseudonyms and identities, along with the need to speak in a ‘neutral’ accent, which contributes greatly to a pressurized working experience and additional layer of complexity in Indian call center employees. In spite of extensive training programs to neutralize the accent, problems remain in the desired quality of interaction between Indian agents and western customers (Taylor & Bain, 2005).

Mirchandani (2004) reported that the call types handled in India are highly routinized and repetitive in nature, being much scripted and of short duration. In India, call handling for overseas customers takes place during night hours, or late evenings, on shifts lasting between eight to ten hours, often six days a week. Employee burnout is common even in good call centers and is probably responsible for the attrition rates between 30% and 35%. Combination of factors as night time working and repetitive call handling are stressful to the employees, affecting their health and social and family life. Research has demonstrated a positive
Chapter 1

Introduction

relationship between night-shift working and the incidence of ill-health (Ferreira, Latorre, Giannini, Ghirardi, Karmann & Silva 2010). However, the combination of night-shift working along with the repetitive call handling makes the Indian call center agents experience more pressure/stress than their UK counterparts (Karasek & Theorell, 1990). According to a survey conducted on BPO employees (2004), the call center ranked high for job attrition due to health reasons. As reported by Kesavachandran, Rastogi, Das and Khan (2006) in India 83% of the call center workers suffer from sleeping disorders, 8.5% from voice disorders, 8.5% from ear problems, 14.9% from digestive problems and 10.6% from eye-sight problems. In a study by Sudhashree, Rohit and Shrinivas (2005), it was reported that Burn Out Stress Syndrome (BOSS) is most common among young people working in call centers in India, characterized by chronic fatigue, sleeping disorders which leads to increase number of sickness absenteeism.

1.3 Need for the study

According to National Association of Software and Service Companies in India, there is a great need to study the health status of the ITES employees, since the number of workers is growing rapidly (Sharma, 2003). In India, the occupational health personnel are gradually awakening to this sort of modern occupational diseases, which is slowly taking its roots among the information technology (IT) professionals. These problems, if ignored can reduce the strength and impair the functioning of the employees, forcing one to change one's profession (Rao, Chandu & Vedachalan, 1999; Choudhary et al., 2002). The importance of voice as an occupational tool is growing with the development of voice activated technology and the increase in the number of individuals working in call centre environments, where vocal demands are high. The call centers are growing at a faster rate with more and more
youngsters joining this profession and increasing the likely interest in the effects of work on voice health and of voice on work. A review of the sparse literature available indicates that, though occupational health and safety issues are evincing an increasing interest in this sector, there continues to be a lack of adequate research in this field, especially in India. Till date, there is only one documented study in India on the incidence of vocal symptoms among CCOs and assessing the prediction value of self report of voice problems for developing a voice disorder. The study using voice handicap index and an adapted version of vocal self perception attitudinal questionnaire in 21 call center operators (Vannan, Bharadwaj, Ravichandran & Atreyee, 2009), revealed that CCOs’ vocal demands affect their quality of voice and that majority of the workers do not give much attention to their voice. However, the study was quite preliminary in nature and included only a few participants.

In UK and Australia, where the call center industry is a lot older, there is a great understanding on the call center workers’ health problems including voice and how to prevent them. Though there have been studies related to the physical and other health related problems of the call center employees in India (Suri & Rizvi, 2008; Noronha & D’ Cruz, 2006), there is a paucity of any documented study with reference to voice. Employees’ health problems and their impact have not reached concern levels. Hence, there is a need for appraisal of such dangers that are lurking in the corner of thriving BPO (Business Process Outsourcing) business. Further, with call center positions being lucrative and attractive to the younger generation, who are not aware of the possible health hazards could lead to occupation related problems in younger population, affecting the general health status of the country. Thus, the present study was warranted as an attempt to understand the prevalence and nature
of voice problems experienced by these professionals as inputs to the knowledge data base and to initiate efforts to minimize or alleviate voice problems in this population.

1.4 Aim and Purpose of the study

Till today, teachers have remained as the most common professional group seeking professional help. Over the last few years, the focus has shifted to call center workers who are now acclaimed as the fastest growing ‘at risk’ sector. Similar to teachers and lecturers, call center workers would also benefit from professional training and monitoring systems to minimize the risk to staff and avoid financial loss through sickness, absence and potential litigation. Hence, the present study was focused on investigating the prevalence and nature of voice problems in call center operators in a typical Indian set up.

1.5 Objectives of the study

The general objectives of the study were:

• Determine the prevalence of voice problems in CCOs using self-reported questionnaire.

• Identify the variables associated with increased risk of voice problems in the CCOs

• Determine the functional impact of voice problems in the CCOs

• Perform a comparative acoustic and auditory perceptual analysis of voice of CCOs (self-reported of frequent voice problems Vs. not reporting of any voice problems)

This study is probably one of the very few that has addressed the vocal characteristics and their impact on the profession of CCOs specific to the Indian context.