Quality of Life among Hearing Loss Patients in Out Patient Clinic in Ain Shams University

Thesis

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By

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List of Abbreviations

Abb.	Full term
AABR	*Automated Auditory Brainstem Response test.*
ANOVA	*Analysis of Variance*
dB	*Decibel*
dBnHL	*Decibel above normal adult hearing level*
HHIA	*The Hearing Handicap Inventory for Adults questionnaire*
HI	*Hearing impairment*
HL	*Hearing loss*
HRQOL	*Health Related Quality of Life*
Hz	*Hertz unit of frequency*
IQOLA	*International Quality of Life Assessment Project*
Max	*Maximum*
Min	*Minimum*
QOL	*Quality of life*
SD	*Standard deviation*
SNHL	*Sensory neural hearing loss*
SPSS	*Statistical Package for Social Sciences*
TEOAE	*Transitory Evoked Otoacoustic Emission*
UN	*United Nations*
USA	*United States of America*
WHO	*World Health Organization*
WHOQOL –Bref	*World Health Organization quality of life Bref questionnaire*

INTRODUCTION

Hearing loss is one of the most common sensory deficits in adults, and it is becoming a severe social and health problem. Hearing impairment in adults is one of the most common chronic illnesses throughout the world; it is the third chronic disability after arthritis and hypertension. The impact of hearing impairment may be profound, with consequences for the social, functional, and psychological well-being of the person ***(Gates and Mills, 2005).***

Development of hearing impairment leads to severe handicap that affects the sufferer's job, home and life with subsequent social and economic burden on the society ***(Abdel-Hamid et al., 2007)***.

Especially in the elderly, hearing impairment can impair the exchange of information, thus significantly impacting everyday life, causing loneliness, isolation, dependence, and frustration, as well as communication disorders ***(Ciorba et al., 2010).***

There are many risk factors for noise-induced hearing impairment. Non-modifiable risk factors include age, genetics, gender, and race. Of these factors, age plays the most significant role. Several modifiable risk factors relate to noise induced hearing impairment. These include the nonuse of hearing protection, cigarette smoking, lack of exercise, low

dietary intake of foods rich in antioxidant vitamins and minerals, the presence of diabetes or heart disease, and poor oral health.

Therefore, the prevalence of hearing impairment may be growing because of increasing exposure to excessive noise, increased life expectancy, smoking, cardiovascular risks and infection ***(Daniel, 2007)***.

Hearing impairment is a global disability affecting nearly 250 million people in the world. Nearly 75% of sufferers live in developing countries. ***World Health Organization global estimates (2013)*** reported that one third of the elderly population aged 65 and above suffers from hearing impairment. Moreover, WHO predicts an epidemiological transition resulting in a rise between 18% and 50% from the year 2010 to 2020 ***(WHO, 2013).***

The prevalence of hearing impairment in several countries has been estimated as 4%, 7.9% 15% and 10.8% in Saudi Arabia, Pakistan, Kenya and the United States of America respectively ***(Abdel-Rhman et al., 2007).***

In Egypt, from 6 randomly selected governorates (Alexandria, Dakahlia, Luxor, MarsaMatrouh, Minia and North Sinai), 4000 individuals were screened for hearing impairment. The prevalence of hearing impairment was 16% with no significant sex differences. There were significant differences

between the age groups and governorates: MarsaMatrouh had the highest prevalence of hearing impairment (25.7%) and North Sinai the lowest (13.5%); those > or = 65 years had the highest prevalence (49.3%), but it was also high in those aged 0-4 years (22.4%) ***(Abdel-Hamed et al., 2007).***

According to the World Health Organization's Quality of Life concept, it is the individual's perception of his/her own projection in life, within the context of culture and value systems in which he lives and in relation to objectives, expectations, patterns and concerns" ***(Mondelli and Soalheiro de Souza, 2012).***

As life expectancy increases and older adults are living longer, an increasing number of individuals will be forced to endure hearing impairment during their senior years. So, Understanding the impact of hearing impairment on quality of life (QoL) is of great importance. Exchange of information with others, an important aspect of everyday life, can be seriously impaired in individuals with hearing impairment. This could lead to a perceived reduction in quality of life ***(Dalton et al., 2003).***

Among the population with hearing impairment, only 39% of the subjects perceive that they have an excellent global QoL level or very good physical health, compared to 68% of those without hearing impairment. Nearly one-third of the population with hearing impairment report being in fair or poor

health, compared to only 9% of the population without hearing impairment; people with hearing impairment are less satisfied with their "life as a whole" than people without hearing impairment ***(Ciorba et al., 2010).***

Although several studies have investigated the association of hearing impairment and quality of life, there are few population-based data to describe the impact of hearing impairment on quality of life in Egyptian adults.

Research Hypothesis

Hearing impairment has an impact of on quality of life of Egyptian adults.

Research Questions:

1. To what extent is the quality of life affected among hearing impaired Egyptian adults?
2. What are other determinants (apart from hearing impairment) affecting the scores of QOL domains?

AIM OF THE WORK

Goal

Improvement of the quality of life of adults with hearing impairment.

Objectives

1. To assess the quality of life (QOL) of hearing impairment among adults in outpatient clinics in Ain Shams University Hospitals.
2. To identify the most important determinants affecting quality of life (QOL) of hearing impairment among adult patients.
3. To detect the effect of hearing aid use on the different domains of the QOL.

Chapter 1

ANATOMY, PHYSIOLOGY AND PATHOGENESIS OF HEARING IMPAIRMENT

Anatomy of the Peripheral Auditory System

The ear is composed of the external ear, the middle ear, and the inner ear (**Figure 1**). The external ear consists of the **pinna** (auricle) and the external auditory canal, and it is immediately accessible to physical examination. Its function is thought to be largely protective, although its physical configuration may provide moderate (5-15 dB) passive augmentation of sounds at the upper range of speech processing frequencies ***(El Kechai et al., 2015).***

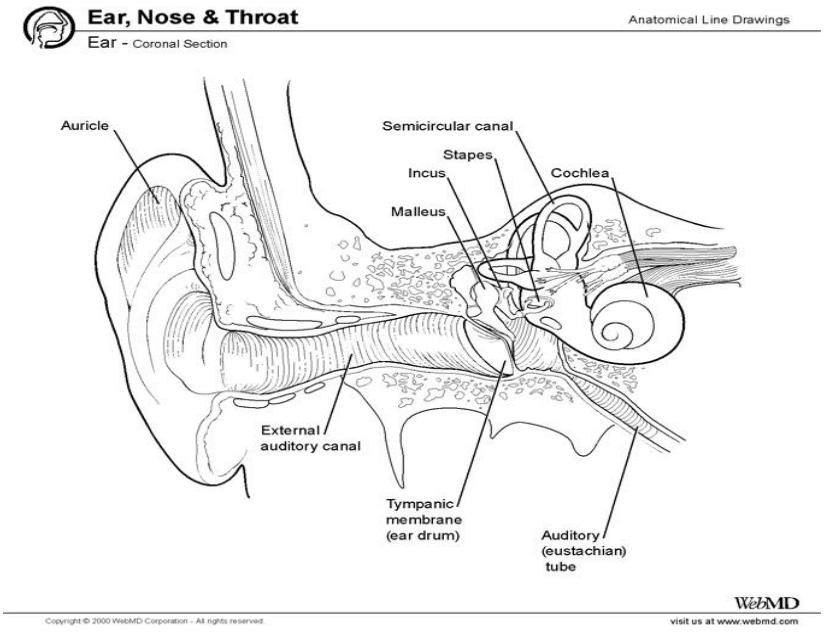

Figure (1): Anatomy of ear ***(Hansen and Lambert, 2005).***

The **middle ear** is bounded laterally by the tympanic membrane (eardrum) and medially by the osseous labyrinth, which is the bone-encased structure that houses the end organs of hearing (*cochlea*) and balance (*semicircular canals*). The healthy middle ear is an air-filled cleft that contains the 3 *ossicles* (*malleus, incus, and stapes*) that transduce vibrations from the tympanic membrane to the oval window of the fluid-filled cochlea. The substantially larger area of the tympanic membrane, compared with that of the oval window, and the relatively minor mechanical gain from the ossicular configuration combine to amplify sound pressures by 20 to 30 dB

(approximately the difference between a whispered voice and normal conversational speech) ***(Hansen and Lambert, 2005).***

The **inner ear** includes the *cochlea*, the *vestibular apparatus*, and the *vestibulocochlear nerve* (cranial nerve VIII). The fluid channels within the cochlea are stimulated by the vibrating stapes footplate through the membranous oval window at the base of the cochlea. These fluid-filled channels (scalavestibuli, tympani, and media) are lined by sensory hair cells, which are organized tonotopically (by sound frequency) in a coiled, spiral shape ***(Maria and Soghalai, 2015).***

The base of the cochlea responds to high-frequency sounds, and the apex responds to low-frequency sounds. Inner hair cells are innervated by a rich array of afferent nerve fibers (10-20 fibers per hair cell) that synapse with auditory division of the vestibulocochlear nerve at the spiral ganglion ***(Yueh et al., 2003).***

Physiology of Hearing Impairment

The healthy ear is an exquisitely sensitive organ. It processes sound frequencies ranging from 20 Hz to 20 kHz. It detects sounds as soft as 0.0002 dynes/cm2 (0 dB) and can tolerate stimuli up to a million times more intense (200 dynes/cm2 or 120 dB) for limited periods of exposure. The ear is particularly sensitive to signals between 500 and 4000 Hz, which includes the frequencies most important for speech signals processing ***(Yueh et al., 2003).***