Optimizing Hearing Aid Utilisation using Telemedicine Tools

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INTRODUCTION

At any given time, a proportion of the population is suffering hearing impairment to some degree, and using a hearing aid may not offer a satisfactory solution. Recognising speech is the most common concern (Arlinger, 2003). Wesendahl (2003) suggests that "Some important reasons for these circumstances are the stigma of wearing hearing aids, an unsatisfactory solution in contrast to the marketing promises of the prescribed device, the quality of fitting in artificial conditions rather than in real soundscapes, and the price"(p56). There have been instances of patient interaction over the Internet, but few holistic solutions. Finding a telemedicine business model that delivers value, makes operational sense and is economically sustainable has been reported as problematic. In this article, some operational and business issues are discussed, and one attempt at a holistic solution is using telemedicine tools is described, followed by suggested topics for further research.

BACKGROUND

In 2010 the US National Institute on Deafness and Other Communication Disorders and the National Institutes of Health jointly sponsored a research working group on accessible and affordable hearing health care for adults with mild to moderate hearing loss. It was suggested (Donahue et al, 2010) that factors influencing accessibility and affordability (which are also factors in other countries, e.g. Dalton, (2003) and Olusanya (2010)) were seen as:

- Changing demographics, with an ageing population increasing the proportion of the population with hearing problems.
- Changing socio-economics, with many groups being economically disadvantaged and under-served.
- Changing technologies, including automated auditory assessment, reduction in hearing aid component costs, fitting programs run on PCs, and possibilities for more compact packaging.
- Changing service delivery paradigms such as store-front sales (e.g. Costco) and internet sales, telemedicine opportunities testing and fitting possibilities.

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Donohue et al (2010) noted that some professional concerns may restrict accessibility and affordability, with an unwillingness to make and sell lower cost devices, and tensions related to the educational qualifications needed to make diagnoses and undertake device fitting.

Mohr et al (2000) noted the significant societal cost associated with hearing loss, that a person could become socially isolated, be more at risk because audible warnings are not heard, and be less productive in the workplace. It has been suggested that sensory decline in older adults, including hearing difficulties, challenge comprehension and memory for everyday speech, and that depression, anxiety, lethargy and social dissatisfaction are often reported (Wingfield et al (2005), Heine and Browning (2002)). Wallhagen et al (2004) noted that a spouse's hearing loss also impacted their partner's physical, psychological and social well-being.

In summary, there are social and economic arguments for increasing hearing aid uptake, but there are also some barriers.

But the proposition has to also make business sense to be sustainable. Wesendahl (2003) reported on successful telemedicine experiments involving initial fitting, setup and fine-tuning a variety of programmable devices in real-world soundscapes such as an office or a noisy industrial environment. Hearing aids can be purchased on-line (America Hears, 2001). Broens et al (2007) reviewed 45 telemedicine conference papers covering a number of applications to evaluate what had influenced their implementation, suggesting five major factors: technology, acceptance, financing, organization, policy and legislation, with acceptance and technology having the largest influence. They suggested that "for success, a visionary approach is required from multi-disciplinary stakeholders, which goes beyond tackling specific issues in a particular development phase"(p303). The view taken here is that telemedicine is an element in a larger socio-technical health care system that may be implemented in a number of ways, but telemedicine offers the potential advantages of remote/socially excluded client access and improved speed of communications. Whether telemedicine is used or not, the same kinds of thing have to be done to service client needs. In broad terms, the required core functions may be characterised as a cyclic pattern of diagnosis, corrective/preventative action and monitoring. Telemedicine may facilitate diagnosis and/or corrective/preventative action and/or monitoring.

MANAGING HEARING IMPAIRMENT

The literature suggests that managing hearing impairment is a multi-stage journey where learning facilitated by social support is needed to deliver successful outcomes. Here we explore in greater depth some issues identified in the literature, and considerations in designing a solution.

Issues, Controversies, and Problems

Knudsen et al (2010) reviewed literature over the prior 30 years where factors influencing hearing aid uptake were considered. The articles covered three stages of hearing impairment management: the period prior to hearing aid fitting, the period covering the fitting and the period post hearing aid fitting. Influence factors were personal (e.g., source of motivation, expectation and attitude), demographic factors (e.g., age, gender) and external factors (e.g., cost, counselling). Only two studies covered the actual fitting process. Self-reported disability was the only linking factor. Some factors (e.g., external motivation) may positively impact one stage, but have no impact on other stages. They felt the most important issues for further research were the interaction between the professional and the client throughout an individual's