

SATISFACTION WITH AMPLIFICATION IN DAILY LIFE (SADL) IN MONAURAL AND BINAURAL HEARING AID USERS

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ABSTRACT

Introduction: This study was aimed to identify the level of satisfaction in monaural and binaural hearing aid users by using the Malay Satisfaction of Amplification in Daily Life (SADL) questionnaire. **Methods:** A total of forty (40) hearing aid users from the International Islamic University, Malaysia (IIUM) Hearing and Speech Clinic at Jalan Hospital Campus, Kuantan, IIUM Medical Specialist Centre and private hearing aid centres participated in this study. Twenty-two (22) of them were monaural users while the rest were binaural hearing aid users. **Results:** The results were categorized based on the means of each subscales (Positive effects, Negative features, Service & cost and Personal image) as well as mean of global satisfaction scores. Positive effects subscale shows the highest mean score with 5.83 while negative features subscale has the lowest mean with 3.95 regardless of different type of fittings. In addition, it was found that there is no significant difference in the degree of satisfaction in monaural and binaural hearing aid users except for negative feature subscale. **Conclusions:** The majority of hearing aid users were satisfied on all four subscales and global score. Assessing patient's satisfaction can be helpful in planning appropriate intervention. Successful hearing aid fitting is correlated with how satisfied the patient is with the outcome provided by the device.

KEYWORDS: Satisfaction, Amplification, Hearing aid users, Monaural hearing aid, Binaural hearing aid.

INTRODUCTION

Hearing loss is one of the most common sensory deficits among human populations. The National Ear and Hearing Disorder Survey (2006) showed a prevalence of hearing loss in 21.57% of the total Malaysian population. The World Health Organisation (WHO) in 2018 reported that around 360 million people in the world are diagnosed with hearing loss. Issues with speech recognition, communication, and language acquisition pose as the potential risks in patients' everyday life as it may lead to social isolation, lack of self-confidence, depression, as well as decreased their quality of life if hearing loss is untreated (Pacala & Yuel, 2012).

Ivory, Hendricks, Ven, Beyar, & Abrams, (2009) stated that hearing aids are the first practical step in aural rehabilitation process that can be helpful for those who suffer from hearing loss. Due to the improvement in digital technology and the emerging speed of speech signal processing, various modern hearing aids are available in the market. However, hearing aid users are still not satisfied and complaints about the poor clarity of hearing speech signals in noisy environments and during phone usage (Kerchkhoff, 2008).

Hence, the outcome measures need to be implemented as it is also one of the rehabilitation components in audiological setting. It can assist to investigate which areas of service or treatment that could be modified or enhanced to better suit client needs (Beck, 2000; Humes, Garner, Wilson & Barlow, 2001). The objective and subjective methods of outcome measures can be used to assess how hearing aids benefit the users. Having said that, only the clients themselves can determine how well hearing aids can fix their hearing problems in real life situation (Huch, 1999; Bentler and Kramer, 2000).

Thus, the aim of this study is to identify the level of satisfaction in monaural and binaural hearing aid users by using the Malay Satisfaction of Amplification in Daily Life (SADL) questionnaire. The SADL questionnaire is one of the numerous self-reported questionnaires that have been developed to assess the user's perception with their current hearing aids performance.

METHODS

Subjects

Forty (40) participants aged 18 and older were chosen from the International Islamic University Malaysia (IIUM) Hearing & Speech Clinic, Jalan Hospital Campus, Kuantan, Pahang, the IIUM Medical Centre, Kuantan, Pahang and private hearing aid centers to participate in this study. All participants were hearing aid users with different types of hearing aid, degree of hearing loss and either with fitted monaural or binaural from all gender, races and religions.

SADL Instrument

The Malay version of SADL questionnaire that has been translated and validated by Ramli (2017) was distributed to the participant. The instrument was originally developed by Cox, Alexander & Cox (1999) and composed of fifteen items that are divided into four subscales; Positive Effect, Negative Features, Service & Cost, and Personal Image. SADL has been selected as it is the most suitable instrument that related to achieve the objective of the study. There are seven scales to score each statement; 1- "Not at all", 2- "A little", 3- "Somewhat", 4- "Medium", 5- "Considerably", 6- "Greatly" and 7- "Tremendously".

Statistical analysis

Independent sample t-test was used to achieve the objective which is to identify the correlation between level of satisfaction among hearing aid users and different types of hearing aid fitting.

RESULTS

Monaural and Binaural Hearing Aid Users

The p-value for all subscales and global score were more than 0.05 except for negative feature subscale with 0.03 (refer Table 1). This result depicts that there is no significant difference in the degree of satisfaction in monaural and binaural hearing aid users except for negative feature subscale.

For positive effect subscale, binaural hearing aid users (6.20) displays higher mean score than monaural users (5.53). On the other hand, the mean for service and cost subscale for binaural were

also higher (5.50) than monaural hearing aid users (5.35). Meanwhile, in negative features and personal image subscales, monaural hearing aid users (4.20, 5.09) have higher mean score compared to binaural users (3.65, 4.80) respectively. In term of global score, binaural hearing aid users have higher mean (5.27) than monaural (5.14). This result demonstrated that binaural hearing aid users were more satisfied in positive effect subscale, service and cost subscale as well as global score whereas monaural hearing aid users were satisfied in negative features and personal image subscales.

Table 1 Mean of different type of hearing aid fitting and p- value

Subscales	Mean		P-value
	Monaural	Binaural	
1) Positive Effects	5.53	6.20	0.22
2) Negative Feature	4.20	3.65	0.03
3) Service and Cost	5.35	5.50	0.74
4) Personal Image	5.09	4.80	0.45
5) Global score	5.14	5.27	0.79

DISCUSSION

Different levels of satisfaction might be expected among subjects with monaural and binaural fitting (Noble, 2006). However, in this research, there was no significant difference observed between all subscales and global satisfaction score with hearing aids in monaural or binaural hearing aid fitting except for negative features subscale.

A study by Bertoli et al. (2009) found that binaural hearing aids fitting showed more benefit to the users as compared to one especially while listening in the presence of background noise. This is because when hearing aid is fitted binaurally, more gains will be provided than monaural hearing as two ears are being stimulated simultaneously. Other studies by Offeciers et. al (2005) and Campos, Russo and Almeida (2003) reported that binaural hearing is essential for listeners to comprehend speech better in silence and noisy environment.

Surprisingly, this study found a contradict results from previous research as monaural fitting shows a higher satisfaction instead of binaural fitting. This is probably because monaural users considered that only one hearing aid may have already met their needs. This is also in agreement with other studies that found unilateral fitting showed better speech recognition in noisy background and reported less discomfort to loud sounds compared to binaural users. (Boymans, Goverts, Kramera, Festen, & Dreschler, 2009; Henkin, Waldman & Kishon-Rabin, 2007; Walden & Walden, 2005).

For personal image subscale, monaural hearing aid users exhibit higher satisfaction in contrast with binaural users in this study. Hosford-Dunn and Halpern (2001) revealed that smaller hearing aids like In-The-Canal (ITC) and Completely-In-The-Canal (CIC) improved satisfaction with Personal Image subscales as they were more satisfied with the appearance compared to Behind-the-Ear (BTE) and In-The-Ear (ITE) hearing aids. Baumfield and Dillon (2001) found that before fitting session, the preference for ITE/BTE hearing aids did not correlate with satisfaction, yet cosmetic preference after use was related to satisfaction level. As majority of the participants in this study wore BTE hearing aids, they may have concern on the cosmetic appearance as BTE devices are more visible in comparison with other type of hearing aids especially for binaural hearing aid users. In this study, due to this concern it might be the reason why monaural hearing aid users have higher satisfaction

than binaural users. Thus, cosmetic appearance needs to be considered when evaluating satisfaction (Wong, Hickson & McPherson, 2003).

On the other hand, higher satisfaction among binaural hearing aid users than monaural was displayed in positive effect subscale, service and cost subscale and global score. Cost is the common factor that made the users refused and considered to be fitted binaurally (Schreurs & Olsen, 1985). However, Kochkin (1992) claimed that cost is the least crucial items that lead to the users' satisfaction while improved hearing in multiple listening environments is the most preferred one. A study by Kochkin and Kuk (1997) revealed that binaurally fitted consumers recognized their hearing aids as "higher value" (cost vs. benefit) than monaurally fitted hearing aids. These findings may be the result of higher satisfaction in binaural hearing aid fitting in cost and service subscale in this study.

Softer sounds that are not perceived in a monaural mode may become audible and louder when the person is aided binaurally due to binaural loudness summation (Kuk, 1999). Besides, Kochkin and Kuk (1997) also showed that binaural hearing aid users were about 15% more satisfied with their ability to tell the direction of sounds (localization) than those wearing a single hearing aid. The ability to localize the sound source is important in daily communication situations. Therefore, these factors might suggest higher satisfaction level in positive effect subscale among binaural hearing aid fitting as it assessed the quality of sounds provided by the devices.

As shown in Table 1, the global score in binaural fitting users was slightly higher than monaural. This may due to the satisfaction of hearing aid users in all aspects that have been covered by all subscales. Binaural amplification needs to be considered for all bilateral hearing loss patients as it provides various benefits. Some of the benefits include better speech understanding in quiet and in noise, better sound quality and better localization of sounds (Kuk, 1999). Moreover, our natural and normal hearing also occurs in binaural way. Binaural hearing will also provide more gain as two ears are being stimulated simultaneously.

CONCLUSION

The Satisfaction with amplification in daily life (SADL) questionnaire is a patient- driven tool that is easy and simple to apply in clinic in order to provide the overall satisfaction among hearing aid users in their real life situation and to identify which area that lead to user dissatisfaction (Veiga, Merlo & Mengue, 2005). Assessing patient's satisfaction can be helpful in planning appropriate intervention.

According to Arakawa (2010), the more satisfied the patient with their hearing aid performance, the more successful the hearing aid fitting. In this study, the results showed binaural hearing aid users were more satisfied in positive effect subscale, service and cost subscale as well as global score. Thus, it reflects that binaural hearing aid fitting gave more benefits instead of monaural.

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