



QUALITY OF LIFE AND SUBJECTIVE BENEFITS OF BINAURAL VERSUS MONAURAL HEARING AID AMPLIFICATION IN INDIAN ELDERLY POPULATION: A PROSPECTIVE COMPARATIVE STUDY

Audiology

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ABSTRACT

Hearing aid fitting strategies significantly impact quality of life and subjective hearing benefit in elderly individuals with age-related hearing loss. While binaural amplification is considered the clinical gold standard, economic constraints often lead to monaural fitting in resource-limited settings. This study compared subjective quality of life and hearing aid benefit between monaural and binaural users using the Abbreviated Profile of Hearing Aid Benefit (APHAB) questionnaire. Methods: A total of 172 elderly adults (86 monaural, 86 binaural) with bilateral sensorineural hearing loss completed a prospective study. The APHAB was administered at 6 months post-fitting. Binaural users demonstrated significantly greater benefit across all APHAB subscales compared to monaural users. Global benefit scores were 28.60 points for binaural versus 18.42 points for monaural users ($p < 0.001$). The greatest advantage was observed in the Background Noise subscale (binaural: 32.79 vs. monaural: 18.42, $p < 0.001$). Binaural amplification provides significantly superior subjective benefit and quality of life improvements compared to monaural fitting.

KEYWORDS

hearing aids, quality of life, APHAB, binaural amplification, monaural amplification, elderly

INTRODUCTION

Age-related hearing loss (ARHL) affects approximately two-thirds of adults over 60 years worldwide (World Health Organization, 2021). Beyond auditory challenges, ARHL significantly impacts quality of life, leading to communication difficulties, social isolation, and reduced well-being (Shukla et al., 2020). Hearing aids represent the primary intervention, with binaural fitting offering theoretical advantages including improved speech intelligibility in noise, better sound localization, and enhanced sound quality (Derleth et al., 2021). Despite these advantages, economic constraints often result in monaural fitting, particularly in low- and middle-income countries like India. This study compared subjective outcomes between monaural and binaural users using the Abbreviated Profile of Hearing Aid Benefit (APHAB).

METHODS

This prospective study was conducted at various audiological rehabilitation centers in North India. A total of 172 elderly adults (86 per group) with bilateral symmetrical sensorineural hearing loss completed the study.

The APHAB is a 24-item self-report questionnaire assessing hearing-related disability across four subscales: Ease of Communication (EC), Background Noise (BN), Reverberation (RV), and Aversiveness (AV). Scores range from 0 to 100, with higher scores indicating greater benefit (aided scores subtracted from unaided scores). The APHAB was administered at 6 months post-fitting. Independent samples t-tests compared mean benefit scores between groups.

RESULTS AND DISCUSSION

At baseline, both groups exhibited nearly identical levels of subjective disability (Global Score ~67). Post-fitting, the binaural group achieved a significantly lower disability score (38.50) compared to the monaural group (48.74). The disparity was most pronounced in the Background Noise subscale, where monaural users continued to report high difficulty (54.22), whereas binaural users reported substantial reduction (38.95) (Table 1).

Table 1: Comparison Of Pre- And Post-Fitting APHAB Scores

Scale	Group	Pre-Fitting	Post-Fitting
Global Score	Monaural	67.16 $\pm$ 4.43	48.74 $\pm$ 3.34
	Binaural	67.10 $\pm$ 4.82	38.50 $\pm$ 3.06
EC (Ease of Comm)	Monaural	60.93 $\pm$ 7.82	41.59 $\pm$ 5.54
	Binaural	61.84 $\pm$ 7.25	36.62 $\pm$ 4.65
BN (Background Noise)	Monaural	72.64 $\pm$ 7.13	54.22 $\pm$ 5.85
	Binaural	71.74 $\pm$ 7.86	38.95 $\pm$ 5.07
RV (Reverberation)	Monaural	67.91 $\pm$ 7.78	50.41 $\pm$ 5.98
	Binaural	67.72 $\pm$ 6.79	39.92 $\pm$ 4.59

Binaural users experienced significantly greater benefit across all

APHAB subscales ($p < 0.001$). Global benefit scores were 28.60 points for binaural versus 18.42 points for monaural users. The greatest advantage was in the Background Noise subscale, where binaural benefit (32.79) was nearly double that of monaural users (18.42) (Table 2).

Table 2: Comparison Of Mean Benefit Scores (Monaural vs. Binaural)

APHAB Scale	Monaural	Binaural	t-value	p-value
Global Benefit	18.42 $\pm$ 1.62	28.60 $\pm$ 2.34	-33.18	<0.001
EC (Ease of Comm)	19.34 $\pm$ 3.42	25.22 $\pm$ 3.68	-10.86	<0.001
BN (Background Noise)	18.42 $\pm$ 2.57	32.79 $\pm$ 3.90	-28.54	<0.001
RV (Reverberation)	17.50 $\pm$ 2.76	27.80 $\pm$ 3.38	-21.88	<0.001

Data logging revealed good compliance, with average daily usage of 6.7 hours. The majority (72.1%) were medium users (4-8 hours), 22.1% were high users (>8 hours), and only 5.8% were low users (<4 hours).

This prospective study compared quality of life and subjective hearing aid benefit between monaural and binaural users in an Indian elderly population. Binaural amplification provided significantly superior subjective benefit across all measured domains, with the greatest advantage in challenging listening environments.

The significantly greater benefit scores in binaural users align with theoretical expectations. Binaural hearing aids provide binaural summation, binaural squelch, and improved sound localization, collectively reducing listening effort and improving speech intelligibility in challenging environments.

The most striking finding was the nearly two-fold advantage in the Background Noise subscale. This has important real-world implications, as communication in noisy environments is often where individuals with hearing loss experience the greatest difficulty. These findings support counseling patients on the functional benefits of binaural amplification and advocating for policy changes to improve access to bilateral hearing aids.

Study limitations include the quasi-experimental design without randomization. Future research should incorporate objective speech-in-noise testing to complement self-report measures.

CONCLUSION

This prospective study demonstrated that binaural hearing aid amplification provides significantly superior subjective benefit and quality of life improvements compared to monaural fitting in elderly adults with bilateral sensorineural hearing loss. The pronounced advantage in challenging listening environments, particularly background noise, supports clinical recommendations for binaural fitting whenever feasible. These findings provide evidence-based

support for counseling patients and advocating policy changes to improve access to bilateral hearing aids.

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