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# Hearing aid satisfaction and differences between self-reported and data logged hearing aid usage time for experienced and first-time hearing aid users

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## Background

Based on studies showing that hearing aid (HA) ownership among people with hearing impairment is surprisingly low, it stresses the importance of improving the likelihood of achieving a successful HA treatment. The level of satisfaction with the HA treatment is assessed using the self-administered International Outcome Inventory of Hearing Aids (IOI-HA) questionnaire.

## Aim

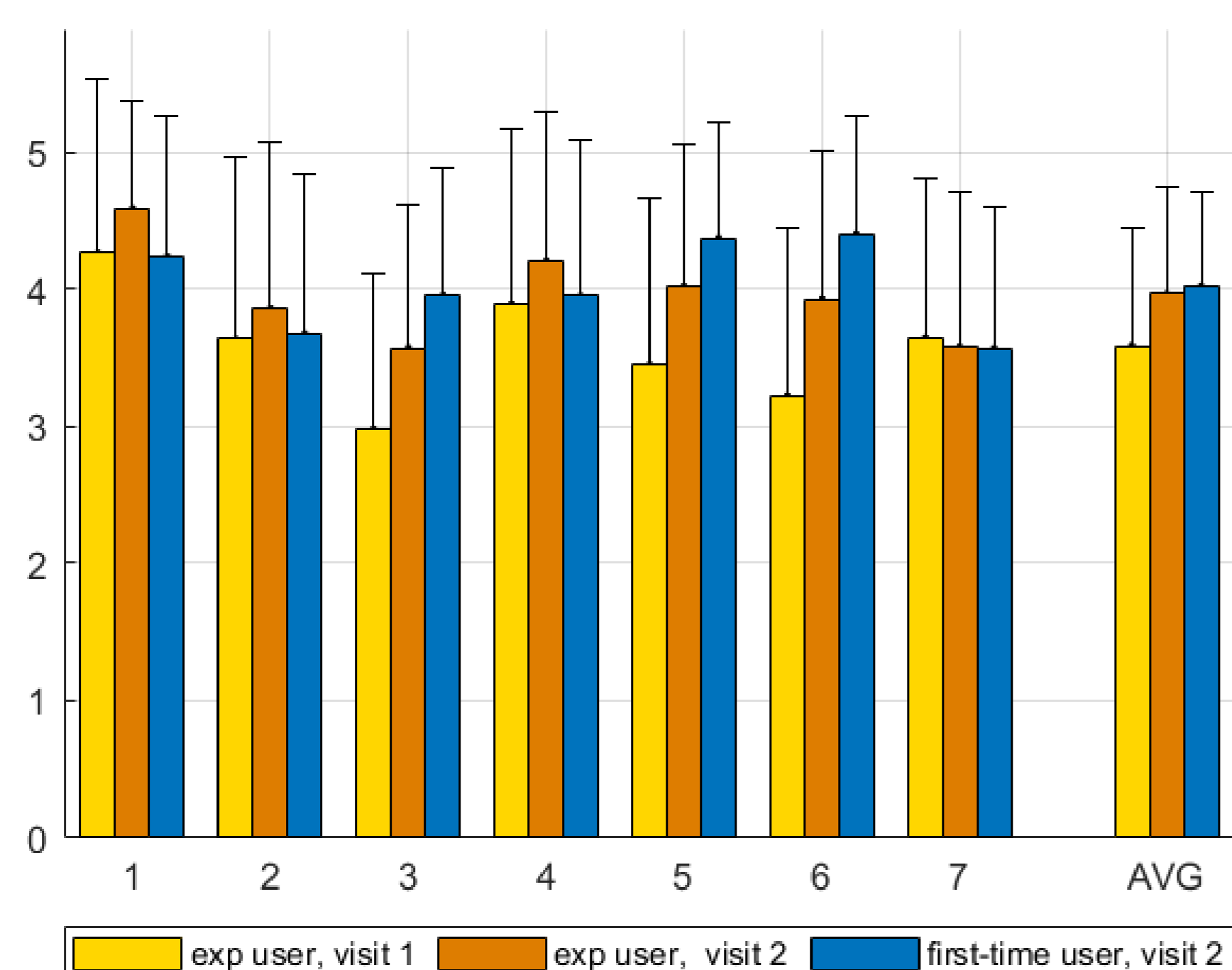
The aims of the current study were to investigate the level of HA satisfaction for experienced and first time HA users, and investigate factors significantly associated with satisfaction of the HA treatment. Furthermore, to evaluate any difference between self-reported and objectively measured HA usage time (through data logging).

## Methods

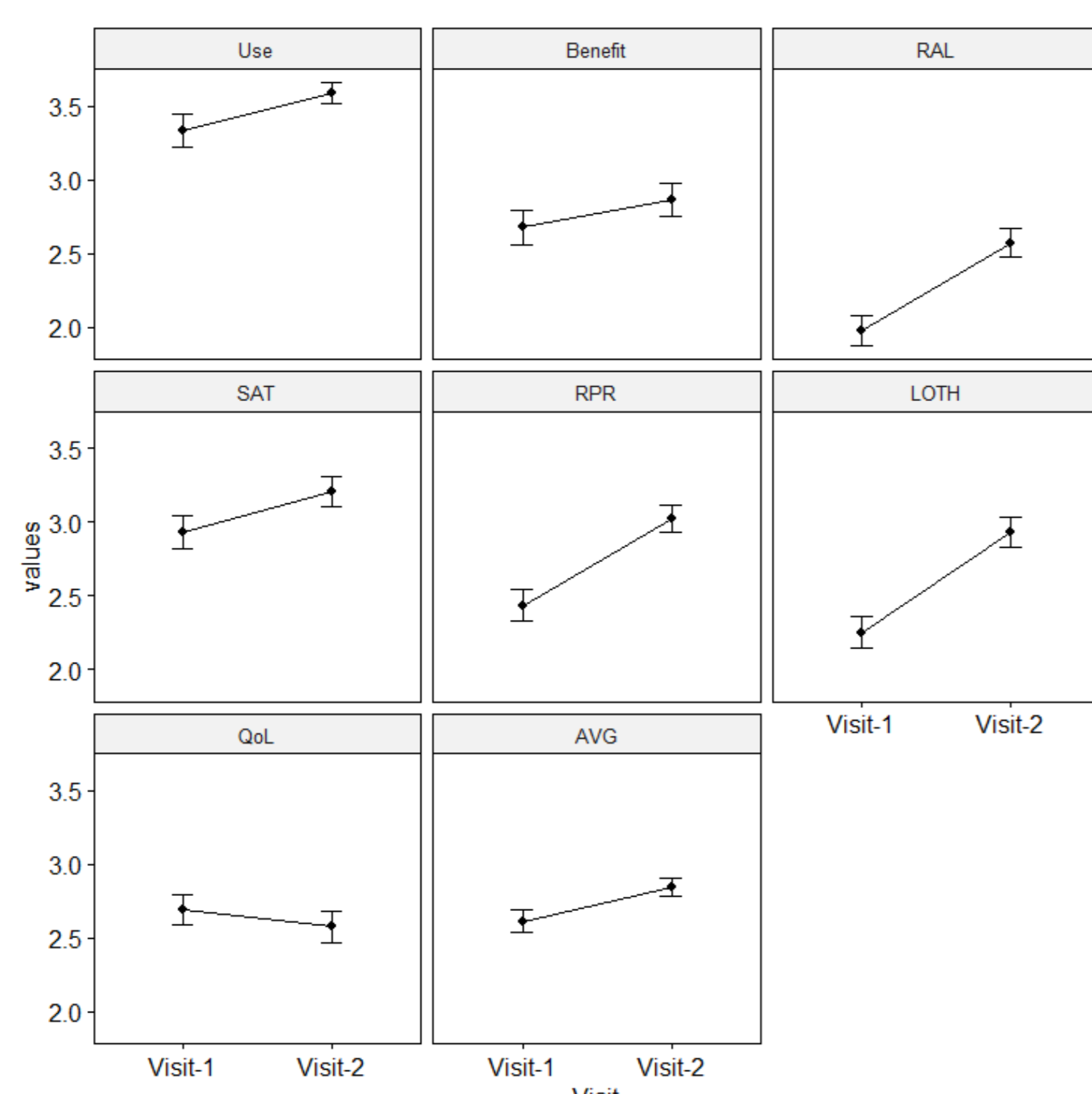
Self-reported questionnaire survey. Patients enrolled in the national BEAR project, from January 2017 to January 2018, answered the seven-item IOI-HA questionnaire targeting different hearing outcome domains; each scored from 1-5. Higher scores indicate better outcomes. Data logged HA usage time was obtained at two months follow-up visit and compared to the self-reported usage time obtained from the IOI-HA item 1.

**Table 1.** Descriptive Statistics of Experienced and First-time HA users responding the International Outcome Inventory for Hearing Aids

	Baseline (exp)	Follow-up (exp)	Follow-up (first-time)
<b>Data size (N)</b>	517	458	1191
<b>Gender (N)</b>			
Female	207	185	523
Male	310	274	668
<b>Age (yr) mean (SD)</b>			
Female	66,3 (13,5)	67,2 (12,7)	66,1 (12,2)
Male	68,8 (10,6)	69,1 (10,7)	67,0 (10,0)
<b>PTA mean (SD)</b>			
Right	47,6 (16,0)	47,6 (15,5)	37,3 (13,5)
Left	47,7 (15,9)	47,6 (15,6)	36,1 (13,4)
<b>DS mean (SD)</b>			
Right	83,1 (18,3)	83,2 (17,6)	89,9 (15,0)
Left	81,2 (20,6)	81,3 (20,2)	88,4 (16,4)



**Fig. 1.** Mean scores for each of the seven items in IOI-HA in experienced (visit 1 and visit 2) and first time HA users (visit 2). 1:Use, 2:Ben, 3:RAL, 4:Sat, 5:RPR, 6:loth, 7:QoL.



**Fig. 2.** Change in mean score for each of the seven IOI-HA items and in average (AVG) of all seven items from visit 1 to visit 2 in experienced users. (Residual Activity Limitation (RAL), Satisfaction (SAT), Residual Participation Restriction (RPR), Impact on others (loth), Quality of Life (QoL), average (AVG)).

## Results

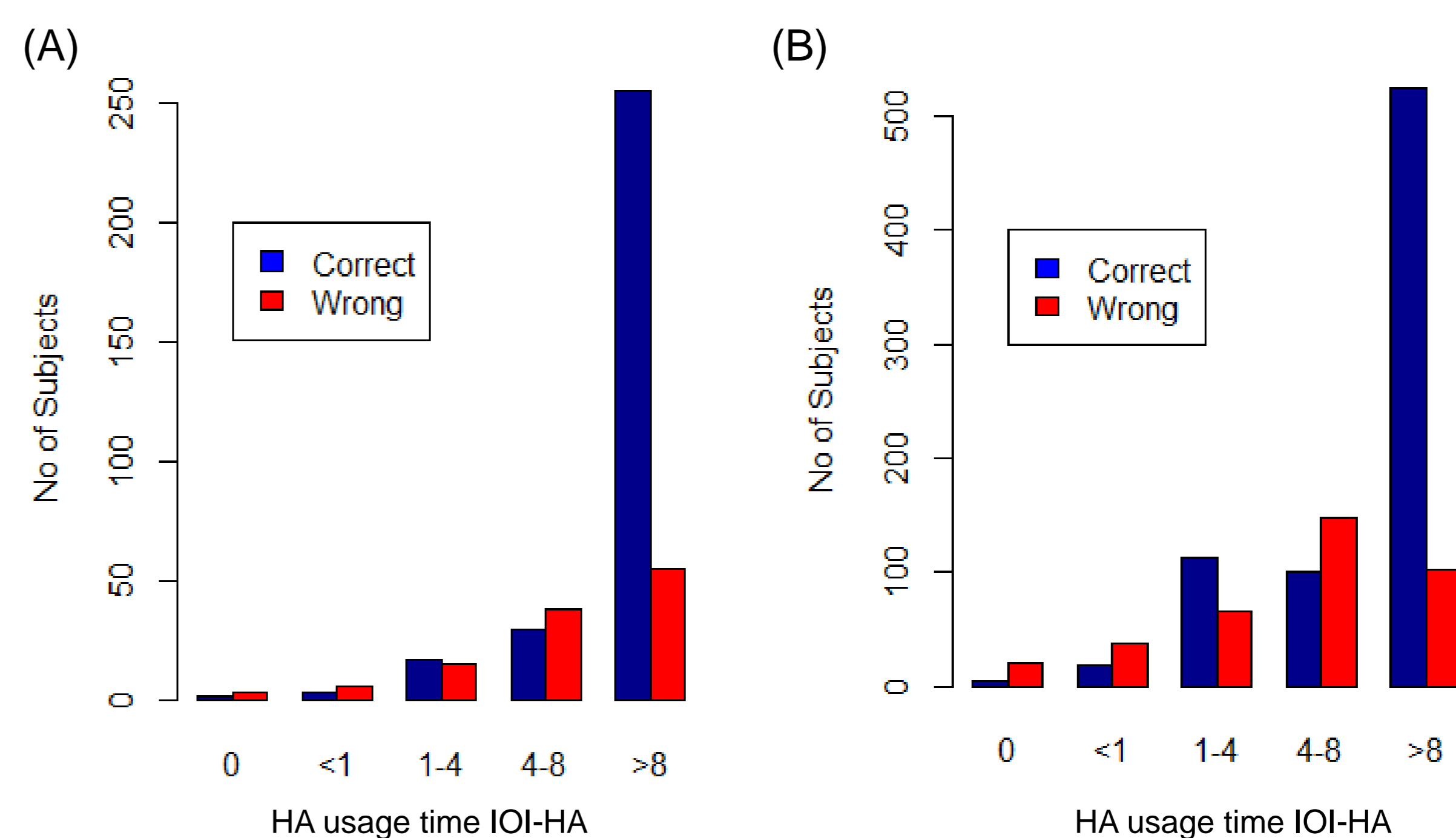
The study population (n=1649) comprised of both experienced (n=458) and first time HA users (n=1191). Experienced users reported before and after two months following HA fitting. First time users reported two months following HA fitting.

Mean scores for each of the seven IOI-HA items was significantly different for first time and experienced users except item 7 (QoL) (fig.1, fig.2). The average IOI-HA score for experienced HA users (fig.2) increased by 0,36 (SD=0,92), and was found to be statistically significant using the non-parametric Wilcoxon Signed rank test.

Multiple linear regression was used to investigate association between the level of satisfaction and motivation, HA usage time, DS and hearing class.

**Table 2.** Factors significantly related with level of total IOI-HA score for first-time and experienced users using the multiple linear regression model. \*p<0.05, \*\* for p<0.01, \*\*\* for p<0.001

Model 1	Factors significantly correlated with level of total IOI-HA score	
	First-time users (n=1049) R-squared=0.2248	Experienced users (n=374) R-squared=0.1585
	Coef. $\beta$	Coef. $\beta$
<b>Motivation</b>	0.14*	ns
<b>HA usage time</b>	0.45***	0.29***
<b>Hearing class:</b>		
Normal	-0.97*	ns
Moderate	ns	1.55*
Moderate-Severe	-1.37*	ns
Severe&profound	-4.12*	-3.25**
<b>Sex (female)</b>	ns	-1.28*
<b>Model 2</b>		
<b>DS</b>	0.03*	0.05*
<b>PTA</b>	ns	ns



**Fig. 3.** Differences between self-reported HA usage time in IOI-HA item 1 and data logged usage time in experienced (A) and first time HA users (B)

Data logging for experienced users showed on average 10.4 hours of HA use (SD=5,10) and 8.35 hours of use (SD=1,02) for first time users. The difference in use time was significant. 73.3% of experienced users (n=460) reported in average a daily usage time of more than 8 hours, whereas 55.8% of first-time users (n=1190) reported an average HA usage time of more than 8 hours.

## Conclusions

Results showed that

- Experienced and first time HA users reported relatively high outcomes, indicating a high level of satisfaction with the HA treatment.
- Experienced users were significantly higher satisfied with their new HA compared to the previous one, which argues that it is meaningful to renew HA after four years following Danish standards.
- HA motivation was shown to be significantly associated with level of HA satisfaction for the first time users, whereas HA usage time, DS and hearing class were shown to be significantly associated with HA satisfaction for both groups of HA users. Compared to first time HA users, experienced users are using their HA significantly more.

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