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Usability Study of Swallis DSA™ Device for Distanced Swallowing Assessment for Older Adults In Nursing Home

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Introduction

- There is a lack of swallowing experts in nursing homes (1,2).
- Swallis Medical offers a medical device (Fig.1) to develop a distanced swallowing assessment using telehealth technology.
- The aim of this study was to assess the usability of the Swallis Device for Swallowing Analysis (DSA)™ by evaluating older adults' compliance and nursing staff's usability.

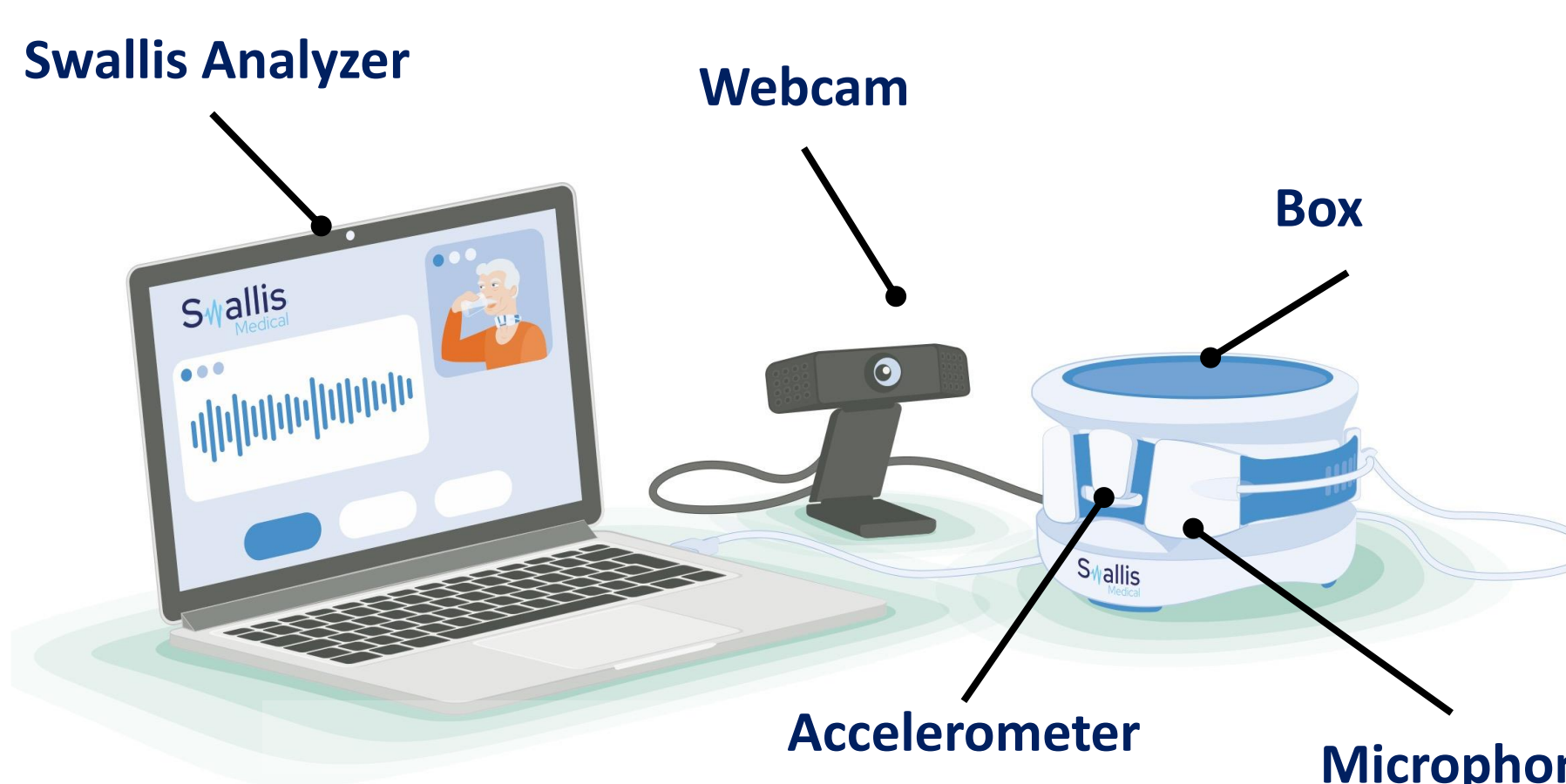
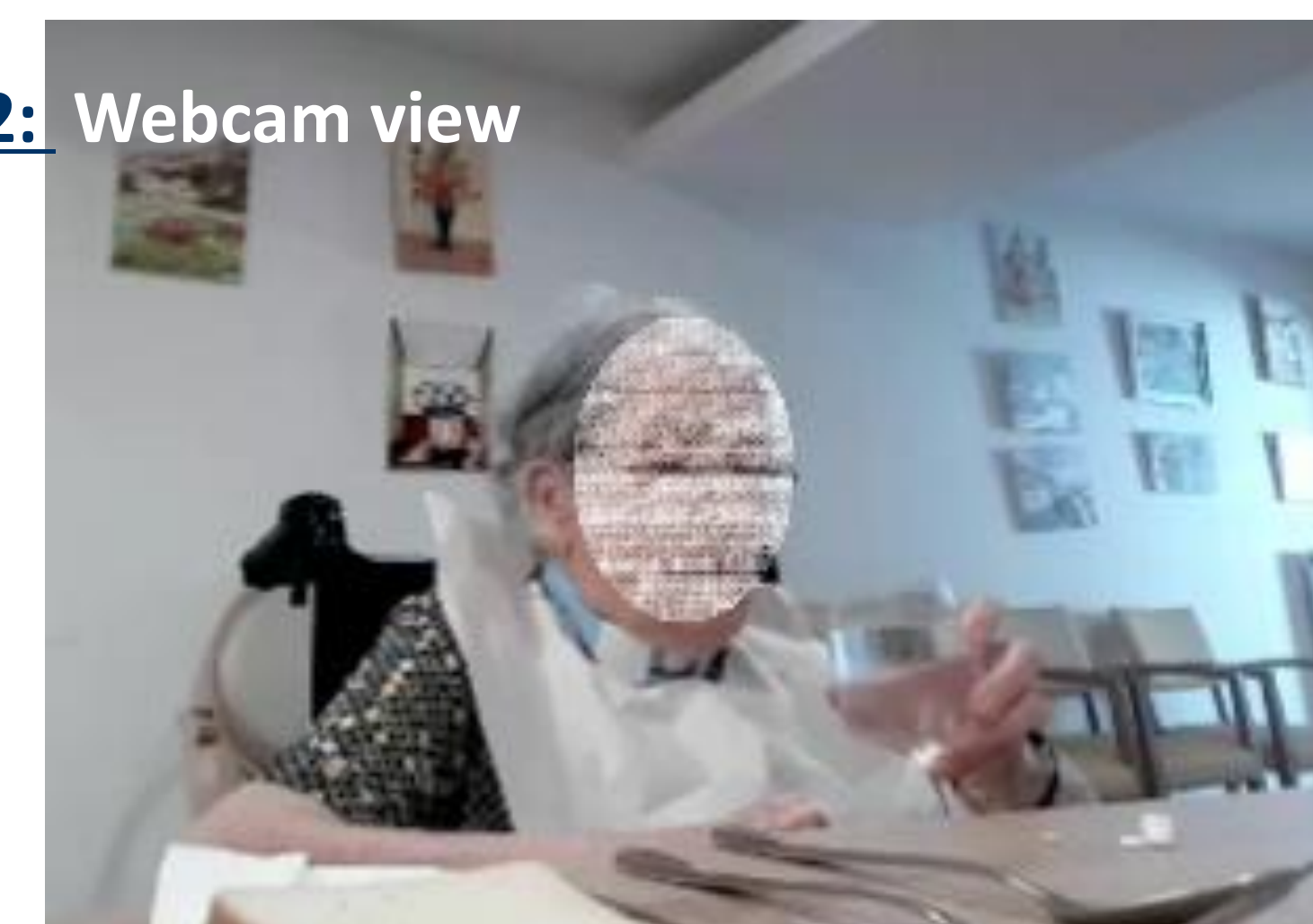


Figure 1: Swallis Device for Swallowing Analysis (DSA)™

Figure 2: Webcam view



The device is composed of a necklace equipped with an accelerometer and a microphone to capture the vibrations and sounds produced during swallowing; a webcam to ensure the video recording of the subject's behavior during the meal; a control unit and dedicated software to ensure the synchronization of the flows (vibro-acoustic and video), to displays the signals and storage for remote analysis (Fig.2)

Methods

- A team of 3 speech therapists experienced in dysphagia is designing, implementing, and experimenting a tele-swallow evaluation with Swallis DSA™ Device for nursing home (Fig.3).
- 62 residents suspected of dysphagia (>60 y) have been included in Swall EHPAD study between May 2022 – January 2023 in 6 nursing homes (NH) located in France.
- The procedure is managed by nursing staff during a meal who place the necklace around the neck under SLP's supervision.

1. Recording of mealtime with the Swallis DSA™ device



2. Remote analysis by the SLP



Figure 3: Study design

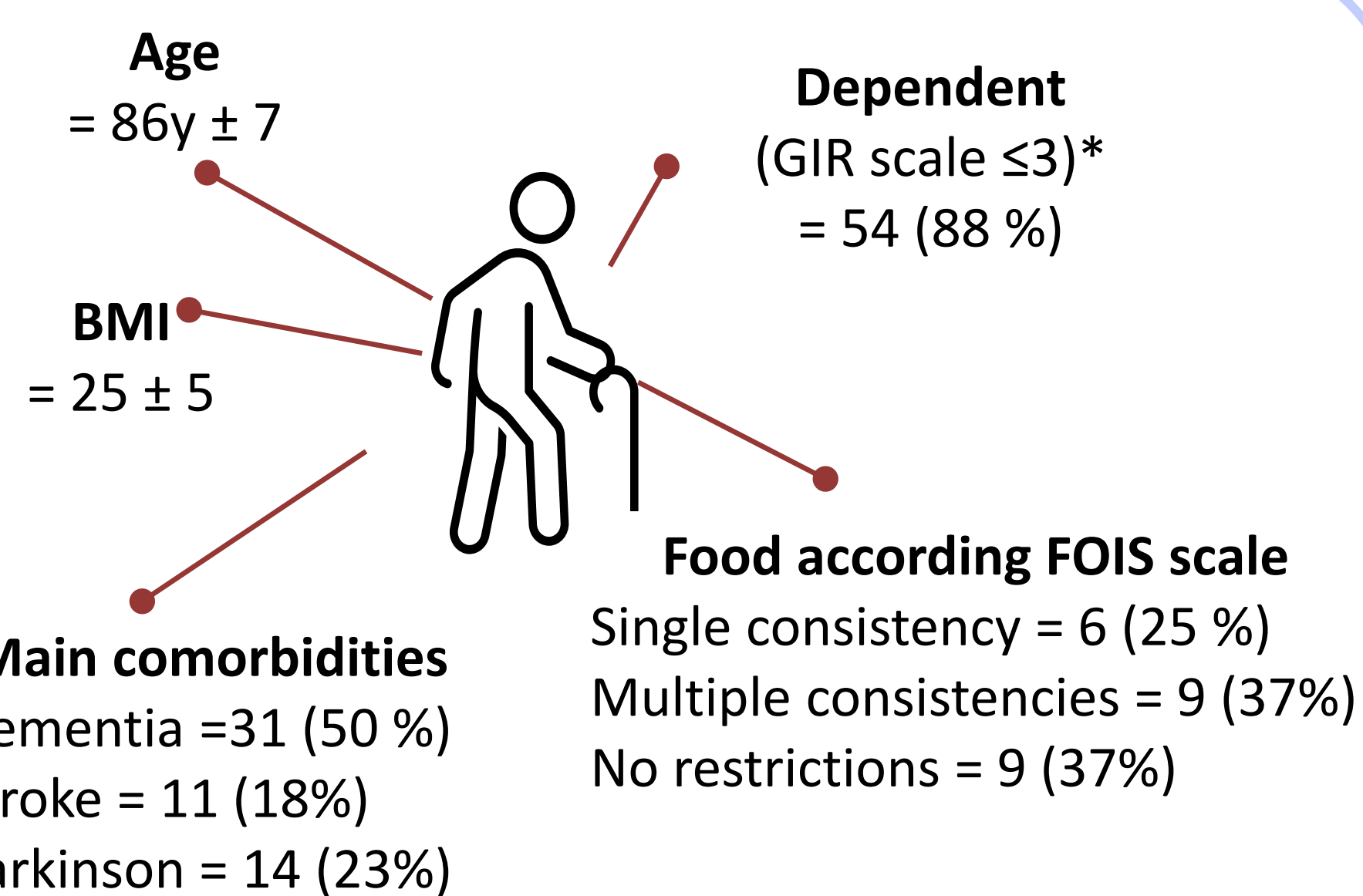


Figure 4: Description of included NH residents

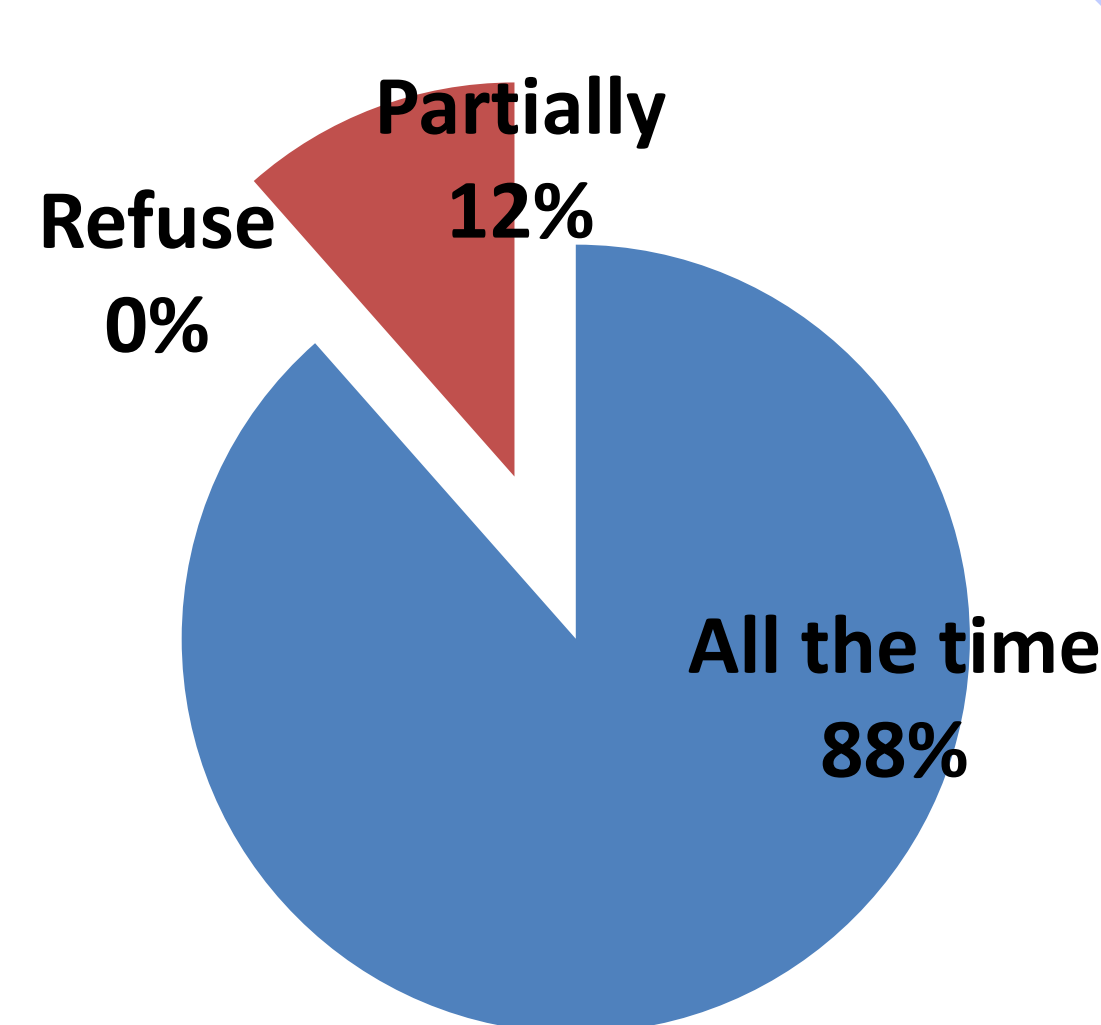


Figure 5: Resident Compliance

Preliminary results

- Most of residents were dependent. Main comorbidities were dementia (Alzheimer's disease or related disorders), stroke and Parkinson disease (Fig.4).
- It was possible to install the device in all subjects and the majority wore the device during a whole meal (up to 45 min) (Fig.5).
- There were some difficulties to install the device (particularly in positioning correctly the necklace), which required the intervention of the SLP to help the nursing staff (Fig.6).
- A prior training provided by the SLP significantly diminish the help needed for the NH staff. (Table 1).

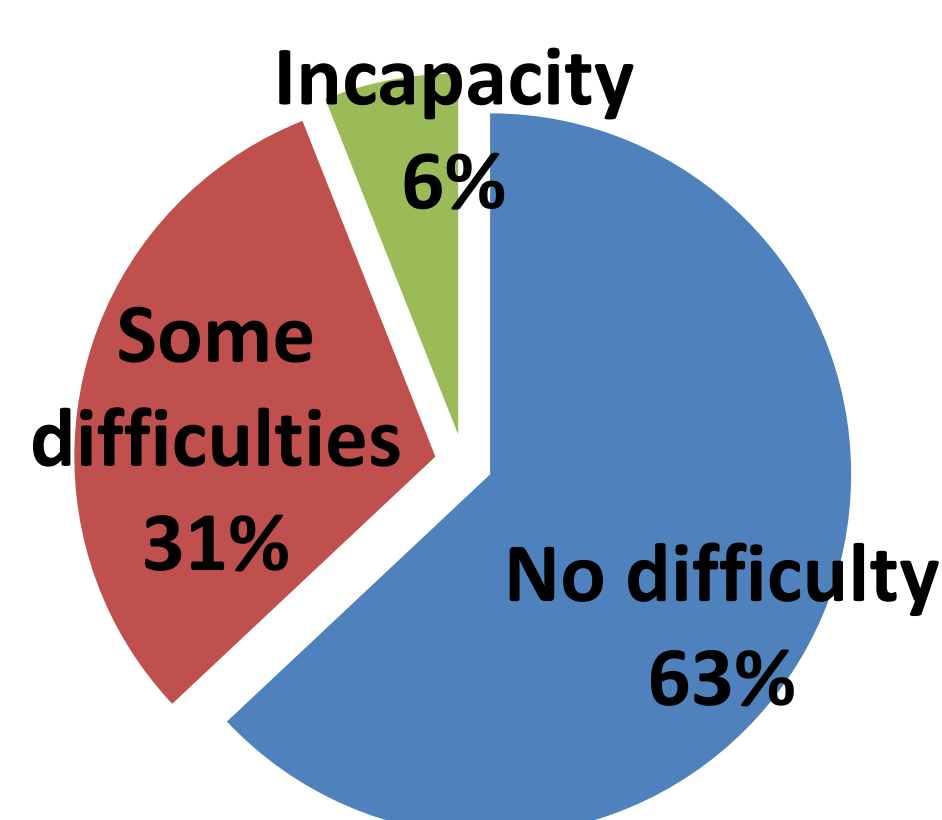


Figure 6: Difficulty perceived by the NH staff to perform the procedure

Table 1: Bivariate analysis Training staff-Usability of device

For NH staff	No prior training	Prior Training	p	1 st use	>1 use	p
Help of SLP to use device	24 (80.0)	6 (20.0)	0.000	29 (96.7)	1 (3.3)	0.000
No help	6 (24.0)	19 (76.0)		10 (40.0)	10 (40.0)	

Conclusion

- Clinical assessment of dysphagia over telehealth technology using the Swallis DSA™ Device is a feasible alternative to face-to-face evaluation.
- Training of the NH staff provided by SLP is necessary to use the device for the 1st time over a 2 hours session.
- The next step will be the analysis of the reproducibility between the present assessment and the remote assessment by SLP.

*GIR = Groupement Iso Ressource.

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 (2) Engh MCN, Speyer R. Management of Dysphagia in Nursing Homes: A National Survey. Dysphagia. 2021 Mar 4. PMID: 33660070.