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APS EXPERIENCE IN SENIORS WITH ALZHEIMER AS A TOOL TO ACHIEVE SDGS IN THE DEGREE OF OPTICS AND OPTOMETRY

María Covadonga Vázquez Sánchez

Facultad de Óptica y Optometría-Universidad
de Santiago de Compostela – Spain
<https://orcid.org/0000-0001-7133-3281>

Luz María Gigirey Prieto

Facultad de Óptica y Optometría-
Universidad de Santiago de Compostela
Santiago de Compostela – Spain
<https://orcid.org/0000-0001-7133-3281>

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Abstract: Through its teaching and research work, the University contributes to the development of just and sustainable societies, since it trains graduates who will implement the Sustainable Development Goals (SDGs). Service-Learning (ApS) connects the student with real social problems and in contexts that resemble the reality of their future profession, being an appropriate teaching methodology for achieving SDGs. Hearing loss (PA) is highly prevalent in the elderly population and is closely related to deterioration in their quality of life. In the subject Audiology in Special Populations (4th year) an ApS experience is carried out in which students carry out clinical practice (hearing evaluation tests) with users of AGADEA (Galician Association for assistance to patients with Alzheimer's type dementia). The objectives of the study are: 1) to determine the presence of PA that may affect the quality of life of the users; 2) examine the acquisition of necessary skills to promote sustainable development by students. The hearing assessment of the users by the students is supervised by a tutor teacher and at the end of the experience each student must submit a portfolio of clinical practice evidence. A high percentage of older users of these centers have disabling AP. Most of the students consider that the experience increases their professional motivation, and they specify that the activity is positive and enriching. The detection of PA makes it possible to improve hearing care care for the elderly by family members and caregivers (SDG 3). Experience forms knowledge and drives the development of values, reflective thinking and the creation of a critical mass that will implement SDGs in the future (SDG 4). In addition, it allows establishing agreements for the development of the ApS experience in the long term (SDG 17).

Keywords: Service-learning, hearing loss, cognitive impairment, quality of life, SDGs.

INTRODUCTION

The SARS-COVID-19 pandemic has exposed the world to new social and economic challenges that force all institutions to promote sustainable development. In turn, experts warn about the importance of achieving the Sustainable Development Goals (SDG) of the 2030 Agenda, since these represent the last opportunity to be able to reverse the current social indicators (García et al., 2019). Higher Education has a transcendental role when it comes to implementing the SDGs, since in addition to being responsible for training graduates to implement the SDGs, it contributes to the transfer of scientific knowledge for its achievement (Sustainable Development Solutions Network [SDSN] Australia / Pacific, 2017). In this regard, after the approval of the Action Plan for the Implementation of the 2030 Agenda by the Council of Ministers, universities have implemented various actions to incorporate the SDGs in the academic field (Chofré et al. 2021). The University of Santiago de Compostela (USC) has an action plan aimed at promoting educational innovation projects in Service-Learning (ApS) (Center for Learning Technologies [CeTa], s.f.). The ApS is one of the essential educational methodologies in Higher Education training proposals, since it integrates learning in educational settings close to real professional contexts for the development of conceptual, procedural and attitudinal skills, as well as training in values (Regina and Ferrara, 2017, Ruiz-Corbella and García-Gutiérrez, 2020). Through practical activities, the ApS articulates academic knowledge with real environmental problems (Lorenzo et al., 2017; Sotelino et al., 2019) that students, mobilizing their knowledge, must solve or improve, thus being the drivers of their own process. of learning (Hart, 2015; Regina & Ferrara, 2017). The social commitment

and practical nature of the ApS make this teaching methodology the appropriate tool for achieving SDGs (García et al., 2019).

In the 2019-2020 academic year, the USC (GOO-USC) undergraduate studies in Optics and Optometry began an ApS experience linked to the optional subject Audiology in Special Populations, which is taught in the 4th year (1st semester). Specifically, the activity is articulated with practical teaching, where the enrolled students carry out clinical practice with users of the Galician Association of Axuda ós Enfermos con Dementias type Alzheimer (AGADEA), which includes hearing screening of the elderly who come to their centers. This study analyzes whether the ApS experience contributes to the incorporation of the SDGs in the GOO-USC studies, setting as objectives: 1) to determine the presence of PA that may affect the quality of life of users; 2) examine the acquisition of necessary skills to promote sustainable development by students.

The literature is conclusive regarding the negative effect of PA on the quality of life of the elderly (Punc et al., 2019; Dixon et al., 2020). detection of hearing problems contributes to improving their attention in care by family members and caregivers, being a way of promoting health and well-being (SDG 3), while facilitating the social inclusion of the person (SDG 16). The high prevalence of AP in people with cognitive impairment (Bisogno et al., 2021; Tran et al., 2021) justifies the need to establish alliances with the entity to expand the experience to other AGADEA centers and prolong it over time (ODS 17). In addition, the concept of ApS is unequivocally linked to that of quality education (SDG 4)

EXHIBITION OF THE APS EXPERIENCE

PARTICIPANTS

The ApS activity carried out included the participation of all students enrolled in the

subject (12 students, 4th year GOO-USC). This experience responds to a previously detected socio-sanitary need, “the undetected hearing deficit in the elderly with cognitive impairment” that the teachers of the subject have observed throughout their professional clinical experience in different groups of the elderly and that is endorsed by different scientific evidence.

Various studies confirm the high frequency of undetected and/or untreated hearing problems in older people with cognitive impairments (Leroi et al., 2019; Yuan et al., 2018). The negative effects of hearing impairment on the general health status of the elderly have also been widely documented (Panza et al., 2015; Punch et al., 2019) and there is evidence that AP especially affects communication ability of people with cognitive impairment (McCreeedy et al., 2018). On the other hand, there is a general tendency on the part of the older population to underestimate BP, considering it “a normal event” of “birthday”, without considering its effects on quality of life (Yuan et al., 2018).

PHASES OF THE ACTIVITY

PHASE 1 (January – February academic year): the teachers responsible for the subject contact the AGADEA entity to request their participation in the experience. A Microsoft Teams meeting was held with the directors of the centers to explain the benefits that the activity would bring to their users. They are also requested to be in charge of obtaining the documents related to data protection and informed consent to participate in the proposed activity (Organic Law 3/2018, of December 5, Protection of Personal Data and guarantee of digital rights) and to schedule the appointments of the volunteers, adapting them to the schedules of their activities in the centers. A total of 20 older adults with diagnosed Alzheimer’s dementia collaborated.

PHASE 2 (February academic year): Prior to the start of the experience, the students were explained (in an interactive seminar session) what the project consisted of and how they must proceed with their tasks in the centers and with the elderly. The clinical practice evidence portfolio with which they would work and which they must deliver at the end of the activity was also discussed and provided. Said portfolio was organized in the following predetermined sections:

- A) Session diary: where the student must collect the characteristics of the patient and the socio-sanitary service provided.
- B) Reflection on personal experiences lived and lessons learned.

In addition, all the doubts that the students might have about the development of the activity were answered.

PHASE 3 (February – May academic year): To start up the clinical service of the ApS experience in one of the nine centers that AGADEA maintains, the students were divided into three groups of four students to perform otoscopy on each of the elderly volunteers (Otoscopy Heine 2000 mini) and Airway Liminal Tone Audiometry (ATL) (range 0.5 – 4 kHz), with MADSEN Xeta Otometrics audiometer and 510-CO-17 headphones. The average tonal thresholds (airway) were calculated to elaborate the audiometric configurations of the AGADEA users. The degree of hearing impairment for each ear was determined following the indications of the PA classification of the American Hearing Association (ASHA) (Clark, 1981). The existence of disabling hearing loss was defined as the average tonal threshold of the frequencies 0.5 kHz, 1 kHz, 2 kHz, 4 kHz greater than 40 dB HL in the better ear (Olusanya et al., 2019).

The socio-sanitary service is implemented in a work area of the entity previously selected according to the requirements of the European standard EN:26-189 equivalent to Standard UNE 74-151-92 and ISO 8253-1:2010 (Figure 2).

The work plan responds to the clinical protocol and ethical principles requested by the USC Bioethics Committee. The responsible teachers played the role of clinical tutors and learning guide.

The assessment of the elderly volunteers made it necessary to create a group rotation system (4 students/group; hours 4:00 p.m. - 7:00 p.m.) (Figure 3), to allow quality and personalized care for patients. Once the clinical work was completed, the students had to hand in the clinical practice evidence portfolio where they collect, in addition to the clinical activities carried out, the experiences they have lived and the learning they consider they have acquired.

RESULTS OF THE ACTIVITY

HEARING SCREENING

Graph 1 shows the average audiometric profiles of the users who participated in the ApS experience, observing a greater decrease in tonal thresholds in the frequencies that contribute the most to word comprehension.

The results of the ATL reveal that 63.64% of the elderly evaluated have some degree of AP, at least in one ear the percentage of subjects with moderately-*severe AP* or higher reached 30% (Graph 2).

Likewise, 54.55% of the elderly live with a disabling hearing deficit.

The proposed clinical practice model has made it *possible* to detect auditory sensory problems that have a direct impact on the quality of life of the elderly (SDG 3). This allows us to establish clinical and social collaboration links with the AGADEA entity to develop this initiative in future academic years and



Figure 2. Area of work and instrumentation of the ApS experience.

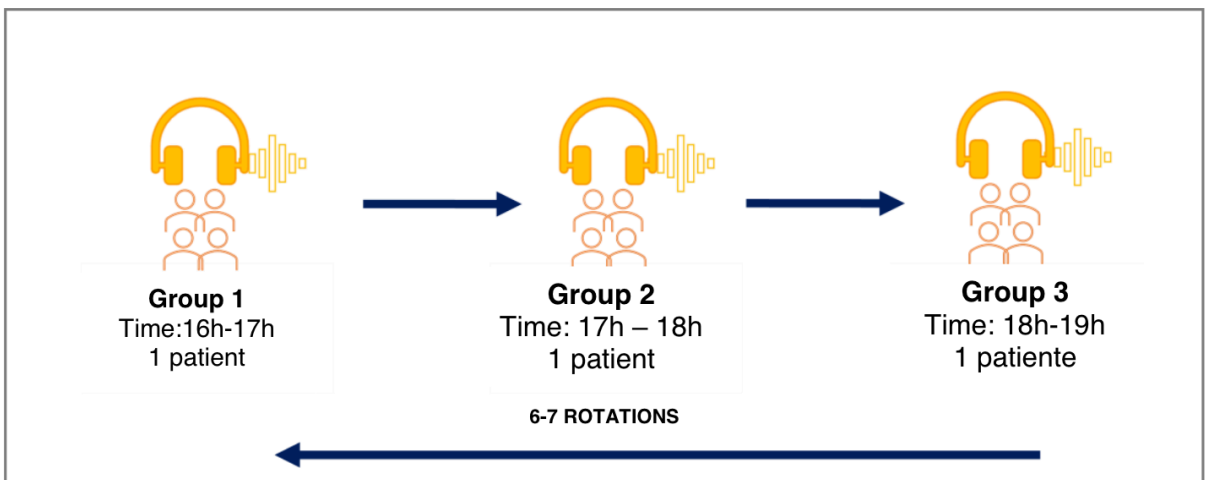
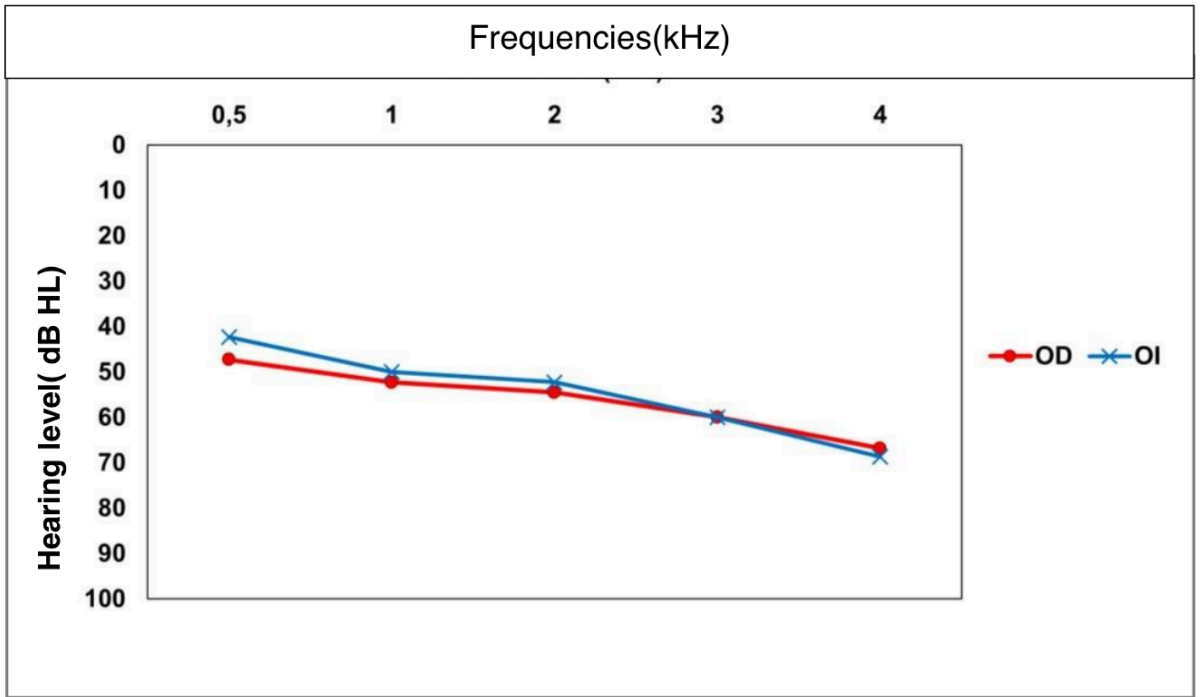
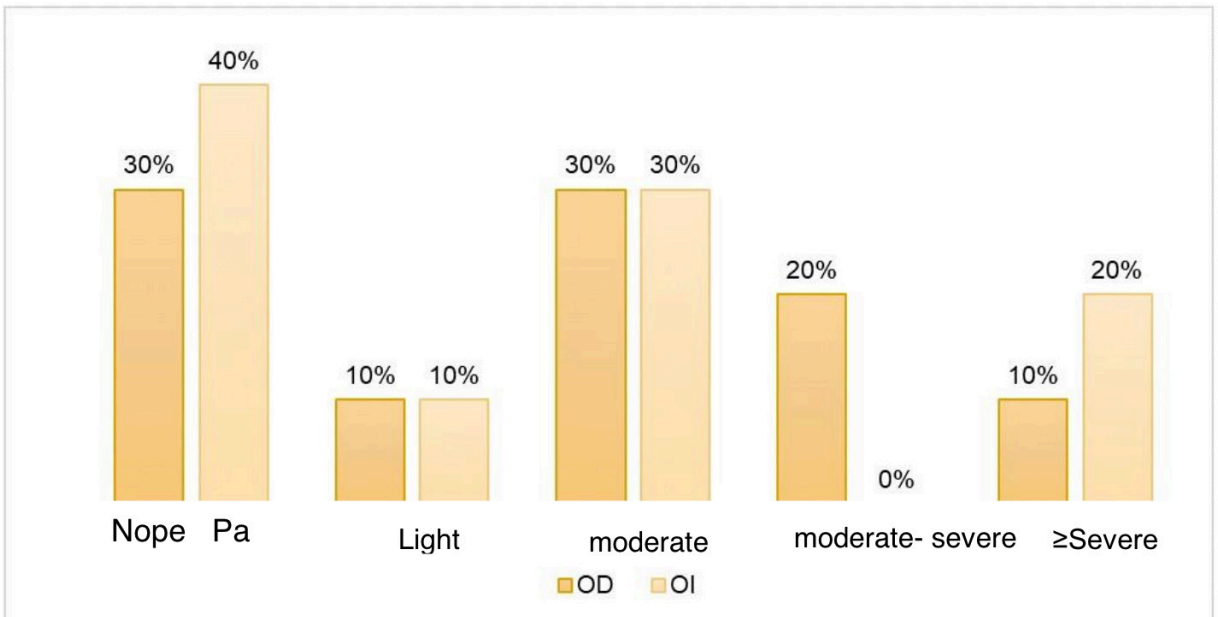


Figure 3: Group rotation dynamics for auditory screening.



Graph 1: Average audiometric profiles of the examined users.



Graph 2: Hearing impairment in the examined users (ASHA criteria).

thus be able to monitor the evolution of the detected deficits and advise family members and caregivers in order to reduce the impact of auditory sensory deficit. in the daily life of the elderly with Alzheimer's disease (SDG 3, SDG 16 and SDG 17).

ACQUIRED SKILLS

Table 1 compiles the competencies that more than 75% of the students participating in the ApS experience have marked as achieved in their portfolios. The acquisition of competences specific to the subject (conceptual and procedural) are reviewed as acquired by all participating students, as well as the improvement of their communication skills. The acquisition of attitudinal skills such as teamwork, fostering empathy, intergenerational communication, ethical commitment, personal initiative or increased empathy, are also reported by a large number of students.

Acquired competence	Alumnas/os, %
Knowledge of the subject	100
Communication ability	100
Autonomous Learning	82
organizational skills	78
Teamwork	89
Development/increase of personal initiative	78
Ability to adapt to new situations	78
Ethical Commitment	78
Motivation for the profession	78
Fostering empathy	89
Increase in intergenerational communication	89

Table 1: Competences reported as acquired by more than 75% of the students.

A considerable percentage of students indicate in the portfolio that the activity carried out has increased their capacity for autonomous learning (69%) and that, after the experience, they consider themselves more critical and reflective (67%).

The information in the portfolio reflects a change in the student learning system, which ceases to be theoretical and becomes "know how" and "involved citizens", inherent elements of quality higher education that is fostered through this experience. of ApS (SDG 4).

The fact that the students have never cared for patients with these characteristics (elderly adults with Alzheimer's dementia) in other subjects of the GOO studies, could justify the great involvement and interest of the students in the ApS activity that we teachers have detected, promoting the development and acquisition of skills. In fact, among the reflections of the students in the portfolio, reference is often made to the ApS experience as a "positive", "useful", "enriching" and "professionally interesting" activity. The interest of the students in the experience described is also evident in their proposals for improvement of the ApS project, since they demand a greater number of hours of practical teaching in order to serve a greater number of users. The enormous collaboration and facilities provided by all AGADEA staff during the activity have also contributed to all this.

CONCLUSIONS



The experience of ApS that encompasses the practical teaching of the subject Audiology in Special Populations has made it possible to detect numerous cases of hearing impairment that affect the subject's quality of life, evidencing an important need for audiological care. Knowing the hearing status of AGADEA users will contribute to improving their care and enhance their quality of life and social inclusion. Therefore, the experience contributes to the achievement of SDGs 3 and 16.



The activity carried out promotes quality education (SDG 4) since, in addition to promoting the acquisition of skills, it forms values, contributing to the comprehensive training of students as professionals and citizens. Quality education implies without any doubt Education for Sustainable Development (ESD).



The good acceptance of the clinical practice model by the student body, together with AGADEA's satisfaction with the service offered in the ApS experience, allows its continuity in successive courses through a long-term collaboration with the entity, which manifest the achievement of SDG 17. This alliance will allow access to users from

other localities located in rural areas where the lack of information or means leads to a greater presence of disabling hearing loss and, consequently, a deterioration in the quality of life of the elderly.

The challenge we have set for ourselves is to mobilize university social responsibility in the face of one of the challenges of the 21st century: promoting the quality of life of the vulnerable elderly. We must develop teaching practices that strengthen ties between the University and society to raise awareness of the importance of "hearing well" in the aging process of the elderly in general, and of those with Alzheimer's-type dementia in particular. Our ApS project is an excellent tool for this.

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