Anales de Pediatría 101 (2024) 286–292

analesdepediatría

www.analesdepediatria.org

SCIENTIFIC LETTER

Home teleassistance using augmented reality glasses: A proof of concept

Teleasistencia domiciliaria mediante gafas de realidad aumentada: una prueba de concepto

To the editor:

Paediatric palliative care (PPC) teams deliver care to children with life-threatening illnesses and their families. Their involvement begins, in many cases, with diagnosis and extends to the most advanced stages of disease through the end of life, continuing with bereavement care for the family. Although many PPC units have been created in Spain, they are still insufficient, and families demand that these services be offered throughout the country and that home care be provided under the best possible conditions.[1]

In the home setting, parents are the primary providers of care for their children, ranging from basic (grooming, feeding and administration of drugs) to complex (management of tracheostomies and mechanical ventilation systems, etc). At any time, incidents may arise in relation to care delivery, medical devices or the underlying disease (fever, seizures, metabolic decompensation episodes, etc).

In this regard, telecare has brought about substantial changes in the remote care of patients with chronic and complex conditions,[2] although it has been based mostly on telephone and videoconference communications. These remote appointments allow immediate access and are highly valued by families,[3] although they could improve with the help of new hands-free communication devices and augmented reality functionalities.[4,5] For this reason, and in order to assess the potential of this technology in the delivery of PPC, we carried out a pilot study in our Paediatric Chronic Disease and Palliative Care Unit.

We used the Vuzix Blade Upgraded augmented reality smart glass model (USA) with the Vuzix Remote Assist (VRA) application, which can be used to make video calls to any device, in our case, a laptop computer connected to the online application (https://vra.vuzix.com). Once the connection is established, communication is hands-free, so that both the individual wearing the glasses and the provider share the same screen and the provider can, if needed, send images or videos to the glasses that are displayed in the lens of the wearer without blocking their view of their environment (patient, device, etc.) (Fig. 1).

To carry out the test, we obtained the consent from the parents of one of our patients hospitalised at home. We proposed a hypothetical scenario concerning the patient's tracheostomy in which mother would be the only caregiver present, who therefore would need to contact our unit. A member of our care team visited the home, to explain to the mother how to use the glasses (which she was not familiar with) and give her instructions on how to call the nurse at the hospital. The virtual consultation lasted 20 min. After the video call, we recorded the opinions of both the mother and the nurse regarding the advantages and disadvantages of this technology (Table 1).

We consider that this preliminary experience, conceived as a proof of concept to take further steps in this line of investigation, has been positive, and that further research and resources need to be invested in this approach to remote assistance and care, which has the potential to improve quality of care and family empowerment.

The mother and the nurse agreed on the ease of use of the glasses, the image quality and the importance of being able to 'share what you see' and have your hands free to do things with a 'live' audiovisual guide (Table 1).

When it comes to the potential drawbacks, the need for a good wireless connection should not be a problem in most households. However, the cost of the glasses (€1500 for the model used in the pilot study) and the user license for the virtual platform (€100 a month) may be a limitation at the present time. However, the rapid pace of technological progress is associated with significant drops in cost, and glasses with similar features are already available on the market for a price similar to that of a mid-range mobile phone.

We believe that effective and affordable technology is currently available and that efforts should be made to apply it to the remote care of children with chronic and complex conditions and their families. If the potential benefits of this technology are confirmed, actions should be taken in parallel to its implementation to regulate and control its widespread use (consent, dissemination of images, data security, etc.).

DOI of original article:
https://doi.org/10.1016/j.anpede.2024.07.007

Funding

This research did not receive any external funding.

Figure 1 Pictures of the virtual appointment and characteristics of the Vuzix Blade Upgraded smart glasses.

Table 1 Advantages and drawbacks of using smart glasses for telecare, from the perspective of the patient' mother and a nurse.

Mother	Nurse
Advantages	*Advantages*
''The glasses are intuitive, I figured out how to use them very quickly''	''The connection was as fast as a video call with a smart phone''
''It is hands-free, allowing handling of the cannula and removal of bandages''	''The image quality was much better compared to usual videoconference applications or video calls with a mobile phone''
''Knowing they can see what I am seeing''	''It is very easy to zoom into what I need to see''
''How quickly you can change views, showing them the tracheostomy, the pulse oximeter...''	''The accuracy of the information that is shared and the education on patient care I can offer by seeing what she is seeing''
Drawbacks	*Drawbacks*
''In an emergency, putting on the glasses is not the first thing that comes to mind. You just dial 112»	''Consultations need to be scheduled, because we need to be connected to the private webpage''
''It requires a good Wi-Fi connection''	''The connection through a website: it is not safe''
''The glasses must be expensive''	''One pair of glasses would be needed per patient''

Conflicts of interest

The authors have no conflicts of interest to declare.

References

1. Navarro-Vilarrubí S. Desarrollo de la atención paliativa, imparable en pediatría. An Pediatr. 2022;96:383–4.
2. Miller KA, Baird J, Lira J, Herrera Eguizabal J, Fei S, Kysh L, et al. The use of telemedicine for home-based palliative care for children with serious illness: a scoping review. J Pain Symptom Manage. 2021;62:619–36.e6, http://dx.doi.org/10.1016/j.jpainsymman.2020.12.004.
3. Bradford N, Young J, Armfield NR, Bensink ME, Pedersen LA, Herbert A, et al. A pilot study of the effectiveness of home teleconsultations in paediatric palliative care. J Telemed Telecare. 2012;18:438–42, http://dx.doi.org/10.1258/jtt.2012.gth103.
4. Aranda-García S, Barrio-Cortes J, Fernández-Méndez F, Otero-Agra M, Darné M, Herrera-Pedroviejo E, et al. Dispatcher-assisted BLS for lay bystanders: a pilot study comparing video streaming via smart glasses and telephone instructions. Am J Emerg Med. 2023;71:163–8, http://dx.doi.org/10.1016/j.ajem.2023.06.035.
5. Aranda-García S, Santos-Folgar M, Fernández-Méndez F, Barcala-Furelos R, Pardo Ríos M, Hernández Sánchez E, et al. ''Dispatcher, ¿Can You Help Me? A Woman Is Giving Birth''. A pilot study of remote video assistance with smart glasses. Sensors (Basel). 2022;23:409, http://dx.doi.org/10.3390/s23010409.

Carmen Agra-Tuñas[a,b,c,d,*], Silvia Aranda-García[c,e,f], Graciela Gómez-Silva[a,c], Verónica Izquierdo[c,d,g], Antonio Rodríguez-Núñez[a,b,c,d,g]

[a] *Sección de Pediatría Crítica, Cuidados Intensivos y Paliativos Pediátricos, Área de Pediatría, Complejo Hospitalario Universitario de Santiago, Santiago de Compostela, Spain*
[b] *Grupo de Investigación CLINURSID, Departamento de Psiquiatría, Radiología, Salud Pública, Enfermería y Medicina, Universidad de Santiago de Compostela, Santiago de Compostela, Spain*
[c] *Grupo de Investigación SICRUS, Fundación Pública Galega Instituto de Investigación Sanitaria Santiago de Compostela, Santiago de Compostela, Spain*
[d] *Facultade de Enfermaría, Universidade de Santiago de Compostela, Santiago de Compostela, Spain*
[e] *Grupo de Investigación GRAFAIS, Institut Nacional d'Educació Física de Catalunya (INEFC), Universitat de Barcelona (UB), Barcelona, Spain*
[f] *Faculty of Health, University Camilo José Cela, Madrid, Spain*
[g] *Red de Investigación Colaborativa Orientada a los Resultados en Salud (RICORS): Intervenciones de atención primaria para prevenir enfermedades crónicas maternas e infantiles de origen perinatal y del desarrollo (RICORS), RD21/0012/0025, Instituto de Salud Carlos III, Madrid, Spain*

* Corresponding author.
E-mail address: Carmen.Agra.Tunas@sergas.es (C. Agra-Tuñas).

https://doi.org/10.1016/j.anpede.2024.09.006

Characterization and management of vertigo in the pediatric population: comprehensive study on the most common etiology, audiovestibular, and psychosomatic manifestations

Caracterización y manejo del vértigo en la población pediátrica: estudio integral sobre la etiología, manifestaciones audiovestibulares y psicosomáticas más frecuentes

Dear Editor:

Vertigo is described as the illusion of intrinsic or extrinsic swaying or spinning motion of either the surroundings or the self. It is a relatively common condition in the paediatric population with an estimated prevalence of 5.20% and 6.00% and with a predominance of the female sex.[1]

These symptoms can result in delayed maturation of postural balance, coordination problems and the development of paroxysmal torticollis (head tilt) to compensate for the deficit.[2] Challenges in the clinical evaluation, anxiety and the lack of communication ability can delay the ordering of vestibular function tests and therefore the definitive diagnosis.[3]

The aims of this study were basically twofold: first, to characterize the most frequent causes of vertigo in childhood from a comprehensive audiovestibular perspective and, second, to assess the potential association with anxiety and depression symptoms in patients with vestibular disorders.

DOI of original article: https://doi.org/10.1016/j.anpedi.2024.07.008.

We designed a cross-sectional retrospective observational study in a tertiary care centre. The sample included 46 patients who were followed for 4.32 years (range, 2–7), with a mean age of 10.19 years (SD, 6.10; range 6–14) and a predominance of female patients (71.73%; n = 33). The statistical analysis was performed with the software R Studio, version 1.4.1106.

In the otoneurological examination using video nystagmography goggles (VideoFrenzel Interacoustics, Denmark), 28.26% of patients (n = 13) tested positive for spontaneous nystagmus, with abnormal visual fixation indicative of a vestibular or central cause. The video head impulse test (vHIT, GN Otometrics, Denmark) yielded abnormal results in 15.21% (n = 7), that is, detected impairment in the vestibulo-ocular reflex indicative of problems coordinating eye movements with head movements. Vestibular evoked myogenic potential testing (VEMPS, Eclipse, Interacoustics, Denmark) detected abnormalities in 45.65% (n = 21), indicating impairment of the otholitic organs responsible for stabilising linear motion and maintaining balance and posture.

The mean pure tone average (PTA) (AC40, Interacoustics, Denmark) was 25.54 dB (SD, 3.64), indicative of mild hearing impairment or loss. From an audiometric perspective, patients with a diagnosis of Ménière disease stood out on account of the aggressive progression typically observed in childhood-onset cases of this disease. However, the patients with the most severe hearing impairment were those with third window syndrome, such as perilymphatic fistula or enlarged vestibular aqueduct, 3 of whom required placement of cochlear implants.

Some of the diagnoses made in the patients with the results of the audiovestibular tests can be found in Fig. 1A, Fig. 1B summarises the management, and Table 1 provides a comprehensive summary of diagnosis and treatment.

It is worth noting that 16 of these patients (34.8%) had a previous diagnosis of depression or anxiety disorder. In fact, 10 of them (62.50%) were currently in treatment with