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RESEARCH

eHealth literacy among older adults in Tamaulipas, Mexico

Alfabetización en eSalud en personas mayores de Tamaulipas, México

Alfabetização em eHealth em idosos em Tamaulipas, México

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Abstract

Introduction: The increased use of technology in recent years has facilitated the management of information and health services. However, many older adults lack the skills to safely use technology for health purposes. **Objective:** To describe eHealth literacy and its relationship with age, schooling and time spent on the Internet among older adults in Tamaulipas, Mexico. **Methodology:** A descriptive-correlational study was conducted with a consecutive sample of 190 people aged 60 years or over who use the Internet and have a mobile device. Those with Alzheimer's disease or dementia were excluded. A questionnaire and the eHealth scale were used to collect data, and the study was approved by the Ethics and Research Committee. Data were analyzed using descriptive and inferential statistics. **Results:** Of the participants, 52.6% were women with an average age of 67.2 years and an average of 9.5 years of schooling. They spent an average of 3.5 hours per day on the Internet and had an average eHealth literacy score of 22.3. A statistically significant relationship was found between eHealth literacy and both age ($p<0.05$) and time spent online ($p<0.05$), but not with years of schooling ($p>0.05$). **Conclusions:** eHealth literacy was low, with older adults having limited skills in searching for, understanding, and evaluating health information on the Internet. Health professionals must guide older adults on how and where to access health information on the Internet, enabling them to benefit from these tools.

Keywords: Health literacy; Older adults; Digital health (DeCS).

Resumen

Introducción: El uso de las tecnologías se incrementó en los últimos años, lo que facilita la gestión de la información y los servicios de salud. A pesar de esto, una gran proporción de personas mayores no tiene las habilidades para usar las tecnologías de forma segura en aspectos de salud. **Objetivo:** Describir la alfabetización en eSalud y su relación con edad, escolaridad y tiempo de uso de internet en personas mayores de Tamaulipas, México. **Metodología:** Estudio descriptivo-correlacional en 190 personas ≥ 60 años, por muestreo consecutivo que utilizaran internet y tuvieran dispositivo móvil, se excluyeron personas con alzheimer o demencia. Se empleó cédula de datos y escala eHEALS, el estudio fue aprobado por el Comité de Ética e Investigación. Los datos se analizaron mediante estadística descriptiva e inferencial. **Resultados:** El 52.6 % eran mujeres con promedio de 67.2 años y 9.5 años de escolaridad. El promedio de uso de internet fue 3.5 horas diarias, la puntuación promedio para la escala eHEALS fue 22.3. La alfabetización en eSalud se relacionó estadísticamente con edad y tiempo de uso de internet $p< 0.05$, no se encontró relación estadística significativa con escolaridad $p> 0.05$. **Conclusiones:** La alfabetización en eSalud fue baja, las personas mayores tenían pocas habilidades para buscar, comprender y evaluar la información disponible en internet sobre salud. Es fundamental que los profesionales de salud orienten a las personas mayores sobre dónde y cómo consultar información de salud en internet y que realmente se beneficien de estas herramientas.

Palabras clave: Alfabetización en salud; Adulto mayor; Salud digital (DeCS).

Abstrato

Introdução: O uso de tecnologias tem aumentado nos últimos anos, o que facilita a gestão da informação e dos serviços de saúde. Apesar disso, uma grande proporção de idosos não possui as competências necessárias para utilizar as tecnologias com segurança nos aspectos de saúde. **Objetivo:** Descrever a alfabetização em eSaúde e sua relação com idade, escolaridade e tempo de uso da Internet em idosos de Tamaulipas, México. **Metodologia:** Foi realizado um estudo descritivo-correlacional com 190 indivíduos com idade ≥60 anos, utilizando uma amostra consecutiva de usuários de internet e dispositivos móveis. Indivíduos com doença de Alzheimer ou demência foram excluídos. Utilizaram-se a ficha de dados e a escala eHEALS, e o estudo foi aprovado pelo Comitê de Ética e Pesquisa. Os dados foram analisados por meio de estatística descritiva e inferencial. **Resultados:** 52.6% eram mulheres com média de 67.2 anos e 9.5 anos de escolaridade. O uso médio da internet foi de 3.5 horas por dia, a pontuação média da escala eHEALS foi de 22.3 pontos. A literacia em eSaúde esteve estatisticamente relacionada com a idade e tempo de utilização da Internet $p< 0.05$, não foi encontrada relação estatística significativa com a escolaridade $p> 0.05$. **Conclusões:** a literacia em eSaúde era baixa; os idosos têm poucas competências para pesquisar, compreender e avaliar informação de saúde disponível na Internet. É fundamental que os profissionais de saúde orientem os idosos sobre onde e como consultar informação sobre saúde na Internet e que estes realmente beneficiem destas ferramentas.

Palavras-chave: Letramento em saúde; Idoso; Saúde digital (DeCS).

Introduction

Currently, several countries around the world are experiencing changes in their population structure. This phenomenon, known as population ageing, is characterized by an increase in the number of people aged 60 years or older in relation to other age groups [(1)]. The World Health Organization [(2)] estimates that by 2050, one in every six people will be over 60 years of age. In 2020, there were 4,821,062 older adults (OA) in Mexico, 139,900 of which lived in Tamaulipas [(3)]. In addition to demographic changes, the Mexican population is undergoing a digital transformation, with information and communication technologies being used more frequently for health-related purposes [(4)]. The term “digital health” or “eHealth” has recently emerged to refer to the use of mobile devices and the Internet to provide and manage healthcare-related information and services. Examples include telemedicine, health apps for mobile devices, portable medical devices for patient tracking and monitoring, secure health information websites and online health education [(5)].

During the Covid-19 pandemic, the use of eHealth increased notably, with social networks playing an important role in raising awareness and disseminating prevention measures [6]. In addition, eHealth facilitated access to information on physical activity, recreational activities, educational activities and entertainment through blogs and digital newspapers [7]. According to data from the "National Survey on Availability and Use of Information Technologies in Households (ENDUTIH)", the time spent on the Internet among the 55 years, and older age group increased by 13.7 percentage points between 2019 and 2022 [4].

Despite their benefits, digital tools also pose a number of health risks if used inappropriately. For OA in particular, many of these risks are likely to be due to low eHealth literacy [8,9]. eHealth literacy encompasses a person's ability to use digital devices safely and efficiently, perform reading and writing tasks in digital formats, interact critically and reflectively, and apply acquired knowledge to solve health problems [9,10]. According to international literature, the prevalence of low levels of eHealth literacy ranges from 34 % to 63 %. Furthermore, women with lower levels of schooling have fewer eHealth skills [11,12]. In Latin America, 82.1 % of adults aged 18 to 59 have inadequate health literacy [13].

The literature review showed that studies analyzing eHealth literacy have been conducted in other countries [11,12]. No studies identifying eHealth literacy in the elderly were found from Latin America; most of the research focuses on measuring health literacy, which involves acquiring, processing and understanding basic health-related information, but not the use of digital tools [13].

It is important for health professionals to identify the skills and competencies that OA have in managing digital tools for health-related purposes, as well as the associated personal factors. OA who can use digital tools extensively can work closely with healthcare professionals to virtually manage and control their disease, as well as perform self-care activities independently and autonomously. This study will enable us to identify the needs of the elderly with regard to the

appropriate and safe use of eHealth. Therefore, the research question posed was: What is the eHealth literacy of the elderly in Tamaulipas, Mexico? The aim was to identify their perception of their IT health skills and how these relate to age, schooling and time spent on the Internet, in order to design strategies to help them make informed decisions about their health and play a more active role in their care.

Methodology

A cross-sectional descriptive, correlational study was conducted [14]. The study population consisted of 424,644 elderly individuals from Nuevo Laredo, Tamaulipas. The sample size was estimated using the statistical formula for finite populations, with a 90 % confidence interval and a margin of error of 6 %, resulting in a sample size of 190 participants. Sampling was consecutive, with the first 190 eligible OA being included. Eligible participants were men and women aged 60 years or older who used the Internet for at least 20 minutes per day, agreed to participate in the study and had a mobile device to be used to complete the survey. Otherwise, those with Alzheimer's disease or dementia were excluded.

A personal data questionnaire was used to measure age; level of schooling and time spent on the Internet. The eHealth Literacy Scale (eHEALS) was used to measure eHealth literacy, which is defined as an individual's perception of their own skills in using health information technology [17]. In the present study, the Spanish translation was used, consisting of eight questions with five response options on a Likert-type scale whose score options are: 1 (strongly disagree), 2 (somewhat disagree), 3 (undecided), 4 (somewhat agree) and 5 (strongly agree). The overall score is estimated by adding up the points; it ranges from eight to 40, where a higher score indicates higher levels of eHealth literacy. Although the original scale has no cut-off points, Lin, et al., [11] found that a score of ≤ 26 suggests low eHealth literacy and a score of >26 suggests high eHealth literacy. The

eHEALS scale demonstrates acceptable reliability, with a Cronbach's alpha coefficient of 0.87. In the present study, the eHEALS scale showed an acceptable Cronbach's alpha of 0.95.

The study was approved by the Ethics and Research Committee of the School of Nursing (FENL-CEI-L002). Data collection was carried out online using Microsoft Forms in April 2024. Family members and acquaintances were invited to participate in the study via a private message on social media. Those who were interested were given an explanation of the study's purpose and a link to access the questionnaires. First, the informed consent form was displayed, followed by the data form and the eHEALS scale. All questions were mandatory, and once participants had completed the survey, they were thanked for their collaboration.

Additionally, the study adhered to the provisions outlined in Chapter I [19] of the General Health Law on Health Research. The anonymity of the participants was maintained by assigning them a folio number (Article 16). The research was considered risk-free (Article 17). Informed consent was obtained in writing via electronic means. This informed the participants of the study's objective and their right to withdraw at any time, while also guaranteeing the confidentiality of the information provided (Articles 20 and 21).

The data obtained were analyzed using the Statistical Package for the Social Sciences (SPSS), version 20. Descriptive and inferential statistics were employed, alongside Spearman's correlation coefficient.

Results

On average, the participants were 67.1 ± 5.6 years old and had received 9.5 ± 3.8 years of schooling. 52.6 % were female and 60 % were married, (Table 1).

Table 1. Sociodemographic characteristics of older adults in Tamaulipas, Mexico, 2024 (n = 190)

Variable	f	%
Sex		
Female	100	52.6

Male	90	47.4
Marital status		
Married	114	60.0
Single	14	7.4
Divorced	7	3.7
Widow and widower	55	28.9

Source: Self-developed Note: f= Frequency, % = Percentage

Regarding time spent on the Internet, it was found that OA used it for an average of 3.5 ± 2.4 hours per day, ranging from a minimum of one hour to a maximum of 12 hours. The internet was used for the following purposes: entertainment (48.9 %), communication (43.7 %), work (5.8 %), searching for health information (1.1 %), and other uses (0.5 %).

The average score on the eHEALS scale was 22.3 ± 8.9 points. The questions with the lowest scores were "I know how to find useful health resources on the Internet", "I have the necessary skills to evaluate the health resources I find on the Internet", and "I am confident in using Internet information to make health decisions", all with the same average ($\bar{X}$=2.7) (Table 2).

Table 2. Descriptive data of the eHEALS scale, 2024 (n=190)

Variable	$\bar{X}$	Mdn	SD	Min. Value	Max. Value
eHEALS global score	22.3	23	8.9	8.0	40.0
1. I am aware of the health resources available on the Internet.	2.8	3	1.3	1	5
2. I know where I can find useful health resources on the Internet.	2.8	3	1.3	1	5
3. I know how to find useful health resources on the Internet.	2.7	3	1.2	1	5
4. I know how to use the internet to find answers to my health-related questions.	2.8	3	1.2	1	5
5. I know how to use the health information I find on the Internet to my benefit.	2.8	3	1.3	1	5
6. I have the necessary skills to evaluate the health resources I find on the Internet.	2.7	3	1.3	1	5
7. I can distinguish high-quality health resources from low-quality ones found on the Internet.	2.8	3	1.3	1	5
8. I am confident in using Internet information to make health decisions.	2.7	3	1.3	1	5

Source: Self-developed Note: $\bar{X}$ = Mean, Mdn= Median, SD= Standard Deviation

Regarding the cut-off points for the eHEALS scale, 62.6 % of the OA were found to have low eHealth literacy (Table 3).

Table 3. eHealth literacy level, 2024 (n=190)

eHealth literacy	f	%
Low	119	62.6
High	71	37.4

Source: Self-developed Note: f= Frequency, % = Percentage

Spearman's correlation coefficient revealed a statistically significant negative relationship between eHealth literacy and age (r_s= -0.236; p <0.05), indicating that older age is associated with lower eHealth literacy levels. However, years of schooling were not statistically related to eHealth literacy levels (r_s = -0.001, p> 0.05). Additionally, a positive correlation (r_s = 0.169, p< 0.05) was observed between eHealth literacy and time spent on the Internet, (Table 4).

Table 4. Spearman's correlation coefficient for eHealth literacy, age, schooling and time spent on the Internet in 2024 (n = 190)

Variable	eHealth literacy
Age	r_s= -.236 p= .001
Schooling	r_s= -.001 p= .984
Time spent on the Internet	r_s= .169 p= .020

Source: Self-developed Note: r_s= Spearman's correlation coefficient

Discussion

According to the results obtained, most of the participants were women with an average age of 67 years and married marital status. These results are consistent with those of other studies which reported a predominance of women, with a similar average age and marital status to those in our study [12, 13 and 20]. Similarly, these results are consistent with Mexican statistics indicating that the majority of people aged 60 years or older are women and that the largest age group is between 60 and 69 years old [21]. The average level of education was nine years, which is similar to the average number of years of education reported for the Mexican population [3]. In order to obtain a more

heterogeneous sample, it is recommended that older persons with high school and higher education be included.

Regarding time spent on the Internet, it was found that older people used the Internet for an average of three hours per day. This finding is consistent with a study from England which found that a significant proportion of older people used the Internet daily [22]. This coincides with the results of the National Survey on the Availability and Use of Information Technologies in Mexican Households (ENDUTIH), which found that people aged 55 and over used the Internet for an average of three hours per day [4]. These results confirm that older people are frequent Internet users and access it on a daily basis. This provides an opportunity to improve access to information and health self-management [23].

Regarding the reasons for using the Internet, it was found that most respondents used it for entertainment and communication. This is similar to data reported in another study, which indicated that the main uses were communication, accessing social networks, and entertainment [4]. This is important because it shows that older people have basic digital skills and find it useful to use digital tools in their daily lives. This could be advantageous when promoting health interventions remotely, as accessing social networks could generate new opportunities for health and information campaigns.

Regarding eHealth literacy, it was found that older people perceived themselves as having few skills, since the mean for the eHEALS scale was 22 points, which is similar to what was found in a study conducted in China [24]. However, this differs from a study in older people in Thailand, whose data reported an average of 30 points on the eHEALS scale [12]. Similarly, another study conducted in the United States found that participants achieved an average score that was higher on the eHEALS scale [24]. Using the eHEALS scale's cut-off point, the results showed that over

half of OA had low levels of eHealth literacy. This differs from a Canadian study, in which OA reported high levels [25].

The results showed that the level of eHealth literacy was lower than that reported in the reviewed literature [12,23,25]. This discrepancy can be attributed to the late introduction of digital tools in Latin American countries such as Mexico. Although access has recently increased, there is still a lack of specific strategies to educate the population and leverage the full benefits of eHealth [26].

The eHealth skills that were most affected by deficiencies were: "I am confident in using internet information to make health decisions", "I have the necessary skills to evaluate the health resources I find on the Internet", "I know how to find useful health resources on the Internet". These data differ from those of a study [12], which reported that OA perceived themselves to be skilled at finding health information on the Internet. However, both studies agree that a large proportion of OA did not feel confident in their ability to distinguish between high-quality and low-quality internet resources. This may be because older people grew up in a different cultural environment and are now trying to incorporate technology into their daily lives [8,27]. Although the older people in this study used the Internet and mobile phones, they did not use them to their fullest capacity as they were unaware of the many functions of digital technologies and of safe websites for consulting health information on the Internet.

Conversely, the relationship between eHealth literacy, age, and the amount of time spent on the Internet was investigated. It was found that older age was associated with lower levels of eHealth literacy, while longer internet use was associated with higher levels [11,24]. This may be because not-so old adults and frequent internet users are more familiar with operating digital tools, which may influence their perception of having better eHealth literacy skills [25]. Additionally, eHealth literacy was not related to years of schooling, contrary to what has been published in the scientific

literature indicating that older people with more years of schooling have higher levels of eHealth literacy [12]. This may be because the average level of schooling was lower than in previous studies. The results showed that OA require the assistance of nursing professionals in order to learn how to use technological devices and the internet as tools for healthcare. Although many OA have basic internet skills and use the internet daily, healthcare providers can play a key role in recommending trusted websites where they can find information and take online courses or training on their diseases and treatments. They can also participate in social networking groups where they can connect with others and share common interests [28]. In the medium and long term, these actions can encourage OA to play a greater role in managing their own health, while also helping to reduce their demand for healthcare.

In addition, nursing-led eHealth literacy is a key strategy for promoting health equity, as it ensures that vulnerable populations benefit effectively from digital technology [29,30]. One of nursing's main contributions in this area is its ability to bridge the digital and social divides that particularly affect older people. In contexts where older people face structural inequalities in accessing health services, or are socially, economically, or functionally disadvantaged, nursing interventions facilitate the appropriate use of digital health resources [29]. This assistance promotes the active inclusion of older people in self-care and informed decision-making, while also aligning with the principles of social justice and universality that should underpin current healthcare systems [31].

The main limitation of this study was the sampling method, meaning the results cannot be generalized to the entire population. Future research should assess the cognitive function of the elderly when analyzing eHealth literacy, since this could interfere with the responses, as could the presence of morbidities that accelerate the neurodegenerative process typical of older age. These conditions were not measured in the present study. Additionally, it is recommended that printed

surveys be applied to older persons not affiliated with social security systems to obtain a more comprehensive overview.

Conclusions

The results showed that the level of eHealth literacy was low among the analyzed sample. OA reported having limited skills in searching for, understanding and evaluating health information available on the Internet. This presents an opportunity to increase eHealth literacy and reduce existing health inequity in Mexico. In addition, eHealth literacy enables healthcare professionals to enhance patient follow-up and minimize time and costs. This study has shown that not-so old adults and those who use the internet for longer periods of time have more eHealth skills. This gives us the opportunity to focus our efforts on this group. However, strategies are needed to guide older people in the correct use of the internet. This would enable them to access reliable information on any health condition, receive online training and manage their health.

Conflict of interest

The authors declare that they have no conflict of interest.

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Artificial intelligence

The authors declare that they have not used any artificial intelligence resources in any of the sections of this manuscript.

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