



Exploring the Link Between e-Health Literacy and Sports Apps Usage for Physical Activity among Older Adults: Should Educational Programs Be Implemented?

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Abstract

The effectiveness of sports apps in promoting physical activity (PA) and improving quality of life in older people is recognised [27]. However, it is also observed that these individuals often face barriers to technology use [20], which may be caused by low e-Health literacy. However, studies explaining the association of e-Health literacy with the acceptance of sports apps are still lacking. This study aimed to assess the level of e-Health literacy among older Lithuanians and to determine its association with attitudes towards app use, self-efficacy and PA behavioural intentions. Methods: Cross-sectional research was conducted. 402 individuals participated in the study (89% women and 11% men), with a mean age of 64.65 ± 5.12 . The eHeals scale was used to measure e-Health literacy [24]. The attitude towards fitness apps scale was adapted from García-Fernández et al. (2020), and the self-efficacy and behavioural intentions scales were adapted from Dhiman et al. (2020). The results of the study showed that older people have a relatively average level of e-Health literacy (26.47 ± 7.93). When analysing the different age groups, a statistically significant decrease in e-Health literacy is observed with each age group ($p < .05$). Correlation analysis showed that e-Health literacy significantly correlates with all measured factors ($r > .400$; $p < 0.01$). Conclusion. E-Health literacy is a significant factor associated with attitudes towards sports apps use, self-efficacy, and PA behavioural intentions among older adults. The declining level of e-Health literacy with age underscores the importance of educational interventions.

Keywords: e-Health literacy, sports apps, older adults, educational intervention

1. Introduction

Physical activity (PA) is one of the key factors in maintaining health among older adults [38]. Low levels of PA are associated not only with poorer psychological well-being [12] but also with an increased risk of sarcopenia [41], chronic diseases, and even mortality [38]. Researchers are increasingly adopting technology-based approaches to pursue effective strategies to promote PA, which has led to a growing focus on sports applications. Recent studies have demonstrated that such apps can significantly enhance PA levels among older individuals [2], [10], [27], [30], and users themselves report growing interest in these technologies [31], [37].

Previous research suggests that self-efficacy, attitudes towards sports apps, and behavioural intentions are important determinants of technology adoption among older adults. Studies indicate that self-efficacy influences performance expectancy [22], effort expectancy, and behavioural intentions [33], [34]. Individuals with higher self-efficacy are more likely to trust and adopt technology due to their greater confidence in their abilities [28]. Attitudes towards sports apps, defined as general emotional responses to their use, are also strongly linked to behavioural intentions [33]. These intentions are related to actual use of apps [5], [11] and intentions to maintain PA [39]. However, despite growing interest in sports apps, older adults often face barriers such as usability complexity, lack of support, or insufficient usage knowledge [20]. These challenges are frequently associated with lower levels of digital or e-Health literacy, which can reduce the acceptance and effective use of sports apps.

Research indicates that individuals with higher levels of e-Health literacy are more likely to engage in health-promoting behaviours [3], positively influencing the use of sports apps [17]. Consequently, scholars highlight the importance of both digital and e-Health literacy education [3], [30]. However, empirical research remains limited in evaluating the level of e-Health literacy and its relationship with attitudes toward sports apps or behavioural intentions to use them. This study seeks to examine whether e-Health literacy is associated with self-efficacy, attitudes toward fitness apps, and behavioural intentions. The findings may offer valuable insights into whether e-Health literacy



influences the use of sports apps and whether targeted educational interventions should be considered.

2. E-Health Literacy as a Determinant of Self-Efficacy, Attitudes, and Behavioural Intentions

e-Health literacy is the ability to understand online health information [16], [24]. The importance of e-Health literacy can be defined in two dimensions. First, the growing gap among older people indicates that some are unable to find and appropriately use e-Health services [3], [29]. Therefore, e-Health literacy and its development can reduce the digital divide [4], helping individuals make informed health decisions and improve health outcomes [35]. Second, the increasing availability of electronic information sources and the growing content volume highlight the need to address the problem of unreliable information. This creates a need not only to know how to find and use information efficiently, but also to be able to assess its reliability [3]. Information found online may be of little value if it is not understood [16], [24], and it can also be harmful if used inappropriately or the source is unreliable.

In line with this, research shows that e-Health literacy is strongly associated with digital literacy, especially among older people, who often demonstrate lower levels of digital competence [15]. However, digital literacy goes beyond the technical skills required to use devices and enables access to a range of services, including healthcare equally [4]. Levels of e-Health literacy have been found to be age-dependent, with older people generally exhibiting lower levels of e-Health literacy [14], [23], [26]. Individuals with higher e-Health literacy tend to be more active users of technology, more critical in evaluating information, and more effective in achieving beneficial search outcomes [23]. In contrast, those with low e-Health literacy often face barriers in accessing and navigating digital information tools [15].

These differences in digital competence and information processing are closely related to self-efficacy, which is defined as confidence in one's ability to perform certain tasks and is positively associated with behavioural intentions [21]. In the context of this study, self-efficacy refers to confidence in using sports apps. Although few studies have directly examined the relationship between e-Health literacy and self-efficacy in the context of sports apps, research involving other technologies suggests a positive association. Individuals with higher levels of e-Health literacy are more likely to feel empowered to use digital tools and apply information found online [8]. Conversely, people with lower literacy levels are more likely to perceive their limitations and avoid situations where they might become apparent [34]. Furthermore, research shows that e-Health literacy often indirectly affects behavioural intentions, with self-efficacy emerging as a key mediating factor [32].

Finally, behavioural intention is defined as a person's plan or readiness to perform a specific behaviour and is considered the closest predictor of actual behaviour. Behavioural intentions to use technology are closely related to actual use [1], [5], [11], as well as to intentions to be physically active [33], [39]. These factors may be influenced by attitudes towards the use of sports apps, which, in the context of technology, are conceptualised as a person's overall emotional response to their use [33]. Research shows that individuals with higher levels of e-Health literacy are more likely to exhibit more positive attitudes towards technology [13], [40], to perceive it as useful [14], and to engage with it. This highlights the broader role of e-Health literacy in shaping both cognitive evaluations and emotional responses towards technology, thereby promoting health-enhancing behaviours.

3. Methods

A cross-sectional study was conducted with 402 participants, of whom 89% were women and 11% were men. The mean age of the participants was 64.65 years (SD = 5.12).

e-Health literacy was measured using the eHEALS scale [24], which was designed to assess individuals' combined knowledge, confidence, and perceived skills in finding, evaluating, and applying electronic health information to health-related issues. The scale consists of 8 items rated on a 5-point Likert scale (1 = Strongly disagree, 5 = Strongly agree). The total score is calculated by summing the item scores, resulting in a possible range from 8 to 40, with higher scores indicating greater perceived e-Health literacy [25].

Attitudes towards fitness apps were measured using a scale adapted from García-Fernández et al. (2020). Self-efficacy and behavioural intentions were assessed using scales adapted from Dhiman et al. (2020). Each of these scales consisted of 4 items rated on a 5-point Likert scale, and the mean score was used as the overall indicator for each construct.



4. Results

The study sample consisted of 402 participants, distributed across four age groups. The largest proportion of respondents (34.1%) belonged to the 61–66 age group ($n = 137$), followed by the 67–72 age group, which included 123 individuals (30.6%). A total of 101 participants (25.1%) were in the 55–60 age group, while the smallest proportion of respondents (10.2%) were aged 73–78 years ($n = 41$) (Table 1).

Table 1. Differences in e-Health literacy across age groups

Age group	N	Mean	Std. Deviation	Sig.	Adj. Sig.
55-60	101	32.23	5.99		
61-66	137	27.07	6.35	.000	.000
67-72	123	23.01	8.04	.000	.001
73-78	41	18.08	5.85	.003	.019
Total	402	26.47	7.93		

The non-parametric Kruskal–Wallis test with the Bonferroni correction was applied to examine differences between age groups, as the normality assumption was not met for the variables of interest. The findings indicate a clear pattern in e-Health literacy across age groups. Participants aged 55–60 demonstrated the highest average score ($M=32.23$, $SD=5.99$), while a gradual decrease was observed with increasing age. The 61–66 age group scored lower ($M=27.07$, $SD=6.35$), followed by the 67–72 group ($M=23.01$, $SD=8.04$), and the lowest scores were recorded in the 73–78 group ($M=18.08$, $SD=5.85$). A Kruskal–Wallis test confirmed that these differences were statistically significant ($p<.01$), and post hoc analyses with Bonferroni correction revealed significant differences between the youngest group and each of the older groups ($p<.05$) (Table 1). These results suggest that e-Health literacy tends to decline with age, highlighting potential age-related disparities in digital health competencies.

Table 2. Relationships between e-Health literacy and age, self-efficacy, attitude towards sports apps, behavioural intentions to use apps or be physically active

Variable	e-Health literacy (r)	Sig. (2-tailed)
Age	-.541	.000
Self-efficacy	.673	.000
Attitude towards sports apps	.472	.000
Behavioural intentions to use apps	.437	.000
Behavioural intentions to be physically active	.379	.000

Pearson correlation coefficients were calculated to assess the strength and direction of associations between e-Health literacy and relevant psychological and behavioural variables.

The analysis revealed a moderate negative correlation between age and e-Health literacy ($r=-.541$, $p<.001$), indicating that older participants tended to have lower levels of e-Health literacy. In contrast, positive and statistically significant associations were found between e-Health literacy and self-efficacy ($r=.673$, $p<.001$), attitude towards sports apps ($r=.472$, $p<.001$), behavioural intentions to use apps ($r=.437$, $p<.001$), and behavioural intentions to be physically active ($r=.379$, $p<.001$) (Table 2). These results suggest that higher e-Health literacy is related not only to stronger confidence and more favourable attitudes but also to greater intentions to engage in health-promoting behaviours.

5. Discussion

This study aimed to assess the level of e-Health literacy among older adults in Lithuania and examine differences across age groups. The evaluation was conducted using the widely accepted e-Health



Literacy Scale (eHEALS), which is designed to measure individuals' skills and competencies related to finding, understanding, and using digital health information [24].

The results of this study showed that adults aged 55 and older have a moderate level of e-Health literacy. This aligns with previous findings highlighting lower levels of digital skills among older adults in Lithuania, particularly in the 55–64 and 65–74 age groups [19]. The European Commission (2023) also reports that only about half of individuals aged 55–64 and just 30% of those aged 65–74 have basic digital competencies [7]. Since e-Health literacy is closely related to general digital literacy, it is not surprising that the participants in this study demonstrated only average levels. What stands out, however, is the consistent decline in e-Health literacy with increasing age – a statistically significant difference. This pattern mirrors results observed in other research, where older adults tend to score lower on e-Health literacy measures [15], [26].

The second aim of this study was to explore the relationship between e-Health literacy and factors such as self-efficacy, attitudes towards sports apps, and behavioural intentions to use these apps and stay physically active. Self-efficacy refers to a person's confidence in their ability to carry out specific actions [21], and previous research has shown that higher levels of e-Health literacy are associated with greater self-efficacy – individuals with better digital skills tend to feel more empowered to use technology [8]. The correlation analysis in this study confirmed these findings, revealing a strong positive association between e-Health literacy and self-efficacy. Given that one of the main barriers older adults face in using technology is fear or a lack of confidence in their abilities [36], it is reasonable to assume that having a solid foundation of knowledge and skills can boost self-confidence, which in turn contributes to more positive intentions to use digital technologies.

The findings of this study also revealed a direct relationship between e-Health literacy and attitudes towards using sports apps. Attitudes toward technology use are considered one of the key factors influencing behavioural intentions, as they reflect an individual's beliefs about whether a given technology is useful, convenient, or worth engaging with [33]. Previous research suggests that higher e-Health literacy may be linked to a more positive attitude towards technology use [13], [40]. Since low e-Health literacy is often associated with reduced self-efficacy and limited digital skills, it can be assumed that a person's competence in using health-related technologies influences their willingness and motivation to engage with these tools.

Finally, behavioural intention is one of the key factors influencing actual technology use and sustained physical activity [1], [5], [11]. Individuals with clear intentions are more likely to actively seek out ways to carry out those behaviours, which is why behavioural intentions are often considered strong predictors of actual behaviour. The results of this study showed that e-Health literacy is directly associated with both the intention to use sports apps and the intention to remain physically active. This suggests that higher e-Health literacy may contribute to more active use of health-related technologies and support a healthier lifestyle. However, previous research has also shown that e-Health literacy may influence behavioural intentions indirectly, through mediating factors such as self-efficacy [32]. Individuals with higher e-Health literacy tend to feel more confident in using digital tools, and this confidence may, in turn, strengthen their intention to continue using such technologies or use them more frequently. Therefore, it remains an open question whether e-Health literacy and perceived knowledge directly affect behavioural intentions, or whether other factors like self-efficacy mediate this relationship. Future research could further explore this pathway through mediation analysis.

In summary, the results of this study showed that e-Health literacy among older adults is at a moderate level and tends to decline significantly with age. This type of literacy is closely related to self-efficacy, attitudes toward technology, and behavioural intentions, suggesting that it plays an important role in encouraging the active use of digital health tools. Researchers studying e-Health literacy and digital exclusion often suggest education as one of the most effective ways to reduce the gap between age and social groups [3], [18], [30]. Based on the findings of this study, it seems that stronger e-Health literacy contributes to a more positive attitude towards technology and greater engagement with digital health tools. Since technology is becoming an integral part of modern healthcare, there is a clear need to address the age-related digital divide in Lithuania as well. Well-designed educational programs tailored to older adults could be one of the most promising ways to support their digital and health-related skills.

6. Conclusion

This study examined the level of e-Health literacy among older adults in Lithuania and explored its associations with self-efficacy, attitudes toward sports apps, and behavioural intentions to use digital technologies and remain physically active. The results revealed that e-Health literacy among



individuals aged 55 and older is moderate and declines significantly with age. This decline is consistent with existing research and highlights the ongoing challenges related to digital inclusion in older populations.

Importantly, the findings showed that e-Health literacy is positively associated with self-efficacy, attitudes toward technology, and behavioural intentions. These results suggest that individuals with stronger e-Health literacy are more likely to feel confident, motivated, and open to using digital tools to manage their health.

Although this study does not represent the entire population of older adults in Lithuania, the findings still offer valuable insights into how digital health skills vary with age. They highlight the importance of targeted efforts to support e-Health literacy in older age groups. Educational programs that are thoughtfully designed and tailored to older adults' real needs and abilities could make a meaningful difference, helping to reduce digital exclusion, build confidence, and encourage a more positive outlook on using technology for health. As healthcare becomes more digital, ensuring that older people are included and supported through accessible education may be one of the most critical steps toward ensuring no one is left behind.

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