



## Research Article

# Development and Evaluation on Web-based Pain Management Program for Older Adults

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## Abstract

**Objective:** The objectives of this paper are to describe the development of the Pain Management Program (PMP) web-based learning platform; and to evaluate the accessibility of content, theme and feasibility of practice of those online learning materials from the perspective of older adults.

**Methods:** The web-based learning platform of PMP was developed for older adults to access the pain / health-related information via the use of the internet. There were ten older adults aged from 60 to 81 (mean 69.9) invited to share their feedback and comments about the PMP web-based learning platform, who all had symptoms of chronic pain at lower back, arms legs and so on body parts at least 5 years; with pain intensity of  $3.5 \pm 2.22$  (on 0-10 scale). This was an empirical study, using qualitative research design to examine the accessibility and feasibility of the online learning materials for older adults. Ten participants were invited to attend an interview using three open-ended questions. The interview data were collected on 1 December, 2022 to 1 January, 2023.

**Results:** Participants were satisfied in using PMP web-based learning platform. It received positive feedback and comments on three categories: (1) Accessibility of content, (2) Feasibility of practice and (3) Satisfaction of web-based learning.

**Conclusion:** The study found that the PMP web-based learning platform can effectively educate older adults with chronic pain. As a result, the web-based learning platform is designed to be user-friendly and convenient. On the other hand, the evaluation of the platform's content, practice, and satisfaction showed positive results, indicating its potential effectiveness.

**Keywords:** web-based learning, older adults, pain management, online learning

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## 1 INTRODUCTION

In modern society, pain is a public health concern. According to pain research in America, the impacts of pain are covered in at least four areas: effects on activities of daily living, productivity, quality of life and risk of suicide<sup>[1]</sup>. For older adults (age  $\geq 60$ ), those effects may cause negative and serious consequences to them, since their body is facing the increasing frailty of old age. Although we are already having pharmacological treatments dealing with pain, the adverse effects of it must be considered to be negative for older adults. Thus, the use of non-pharmacological treatments such as physical exercise, needs to be suggested as an alternative way for relieving and managing pain for older adults.

The population of older adults (age  $\geq 60$ ) in Hong Kong accounts for 45.6% in 2022 (C&SD, 2022), approximately 50% of Hong Kong older adults are experiencing pain<sup>[2]</sup>. Chronic pain is a multiple and complex experience in one's physical, mental, social and spiritual dimensions. In addition, physical and psychological ailments brought by chronic pain such as decreased appetite, lower sleep quality and more negative emotions will greatly affect one's daily activities and decrease one's quality of life<sup>[3]</sup>. Physical exercises are able to increase people's body activities, in order to ameliorate their body condition such as to improve immobility and hypokinesia, and help them to relieve pain and to practice pain management as well<sup>[4]</sup>.

Nowadays, people are often using the internet in their daily life. We talk to people on a digital platform; we communicate with others by sending photos and we learn things by watching videos. Especially due to the COVID-19 pandemic, online activities have become more preferable for people to continue their daily tasks. Many schools and civil facilities are locked down in order to reduce the risk of infection, at the same time, this created a chance to reconsider the relationship between the internet and older adults.

Online learning can be defined as engaging with technology devices to access the internet<sup>[5]</sup>. According to the previous research about the relationship between online learning and older adults, many of the older adults are interested in health-related knowledge on the internet which corresponds with their health issues, some of them may be conducted with self-paced learning<sup>[6]</sup>. For older adults, the engagement of the internet is possible to enhance their social participation and connectivity. Furthermore, it also provides education opportunities in people's later life<sup>[7]</sup>. Besides, there are several benefits for older adults to use the internet to access health-related information. For example, it could enhance their sense of control. By accessing health-related information online, older adults can take a more active role in

managing their health and making informed decisions about their care. On the other hand, it can improve communication with healthcare providers. Older adults who are more informed about their health may be better equipped to communicate with their healthcare providers and ask questions about their care. Importantly, it could potentially improve their quality of life<sup>[8,9]</sup>.

In Hong Kong, the web-based health educational platform "Re: Fresh" (<https://refresh.bokss.org.hk>) is an example of the web-based learning platform. It is not only providing health information but also to promote it by holding regular online talks in the community. In a policy aspect, the HKSAR government promotes the policy of "aging in place", it suggested cooperating with and funding governmental and non-governmental organizations to promote technological services to older adults like the project of Gerontechnology<sup>[10]</sup>. It provides services like innovating elderly-related products which merge gerontology and technology.

Given the lack of pain management education for older adults in Hong Kong, especially in the mode of online learning<sup>[11]</sup>, it is a chance to study the effectiveness of it by studying the accessibility and feasibility of the materials provided in the "Pain Management Program" (PMP) online platform. The study will be focusing on the development and evaluation, such as to examine the content, and web-based learning experience especially for older adults in Hong Kong.

Thus, the website of the PMP has been set up for the public to access the learning materials through the internet. There are three kinds of learning materials provided on the online platform: photos, videos and texts. Those materials are conducted with different forms of presentation (textual and visual) to let the learners understand the content through different ways.

Therefore, there are two objectives of this paper:

- i. Development: to describe the development of the PMP online learning platform.
- ii. Evaluation: to analyze feedback from the older adults through interviews by examining the accessibility of content, theme and feasibility of practice of those online learning materials.

## 2 MATERIALS AND METHODS

### 2.1 Development

The website, <https://pain-management-program.mailchimpsites.com> was launched on 25 November, 2022. Four lessons of learning materials are uploaded into the website.

To describe the development of the web-based learning platform, it is necessary to describe the whole

settings of it which includes the use of teaching and learning materials, content and the intended purpose.

### 2.1.1 Materials and Content

There are four lessons of the program, each lesson including two sections: concept learning and exercise practicing. The first section is about 15 to 20min and will be conducted with teaching concepts and knowledge of pain and pain management. The second section is about 25 to 30min and will be conducted with physical exercises, participants will be invited to follow the instruction videos and practice those exercises.

The content of four lessons includes the idea of “Pain”, introducing different kinds of therapy, such as non-medical therapies and so on. For the exercise session, it will be introducing physical exercises like towel exercise and musical movement. For details, the schedule of the program for older adults has been attached (see [Table 1](#)) (for pictures of the website see [Figures 1-3](#)).

The information provided on the online platform is combined with several sources from the professionals such as government, physiologist, university researches, health organization and hospital. In section 1 (concept learning), it introduces the definition of pain, effects of pain, measurement of pain and pharmacological and non-pharmacological treatments. The information includes the professional medical suggestions from specialists and experts including International Association for the Study of Pain, Hong Kong Hospital Authority, Hong Kong Department of Health and other governmental and professional organizations. The section of physical exercise (section 2) including towel exercise and musical movement. They are both the health recommendations of “Fitness Programmes for the Elderly” from HKSAR government department - Leisure and Cultural Services Department (<https://www.lcsd.gov.hk/en/healthy/fitness/elderly.html#1>).

### 2.1.2 Intended Purpose

For section 1, it is intended to introduce the basic concepts of “pain” and “pain management” to older adults. Mainly, it is more focused on non-medical therapies. Participants could learn the relationship between “pain management” and “physical exercise”.

For section 2, it is intended to teach older adults the techniques of the physical exercises. Through the instruction videos they can learn to practice those exercises in their daily life, and to manage pain on their own.

In general, the intended purpose of the web-based PMP for older adults is to encourage the participants to strengthen their ability of “self-caring”, and to strengthen

the ability and knowledge of being caregivers as well. In short, to practice pain management in their daily life and improve their quality of life.

### 2.2 Evaluation

This is an empirical study, in order to investigate the effectiveness by collecting the personal point of views from the participants. Thus, the qualitative research design will be conducted to examine the accessibility and feasibility of the online learning materials for older adults. In order to collect the feedback from the participants, there are three open-ended questions to ask in the interviews. There are 10 participants involved. The interview data was collected from 1 December, 2022 to 1 January, 2023.

### 2.3 Participants and Design

There are several reasons why older adults may have difficulty accessing information from the internet. First of all, they lack digital literacy. Many older adults did not grow up with technology and may not be as comfortable with using computers, smartphones, or other digital devices. This can make it more difficult for them to navigate the internet and find the information they are looking for. Second, the information from the internet is overloaded. The internet can be overwhelming, with a vast amount of information available on any given topic. Older adults may have difficulty filtering this information and identifying what is relevant to their needs. In short, these factors can make it more difficult for older adults to access information from the internet. However, with appropriate support and resources, many older adults can learn to use technology and access the information they need online. Thus, the question shall be based on their difficulties.

The interviewees are selected when satisfied the following criteria:

- Age  $\geq 60$
- Having the symptoms of chronic pain
- Able to speak and understand Cantonese
- Can read Chinese
- Having a device to access the internet

## 3 RESULTS

There were 10 participants involved in the interviews. There were 60% male and 40% female. Age ranged from 60 to 81 and the mean is 69.9. All of them were retired. They worked as construction workers, clerks and salespeople before their retirement. They reported their pain symptoms in the lower back, arms, legs and neck. For details, please see [Tables 2 and 3](#).

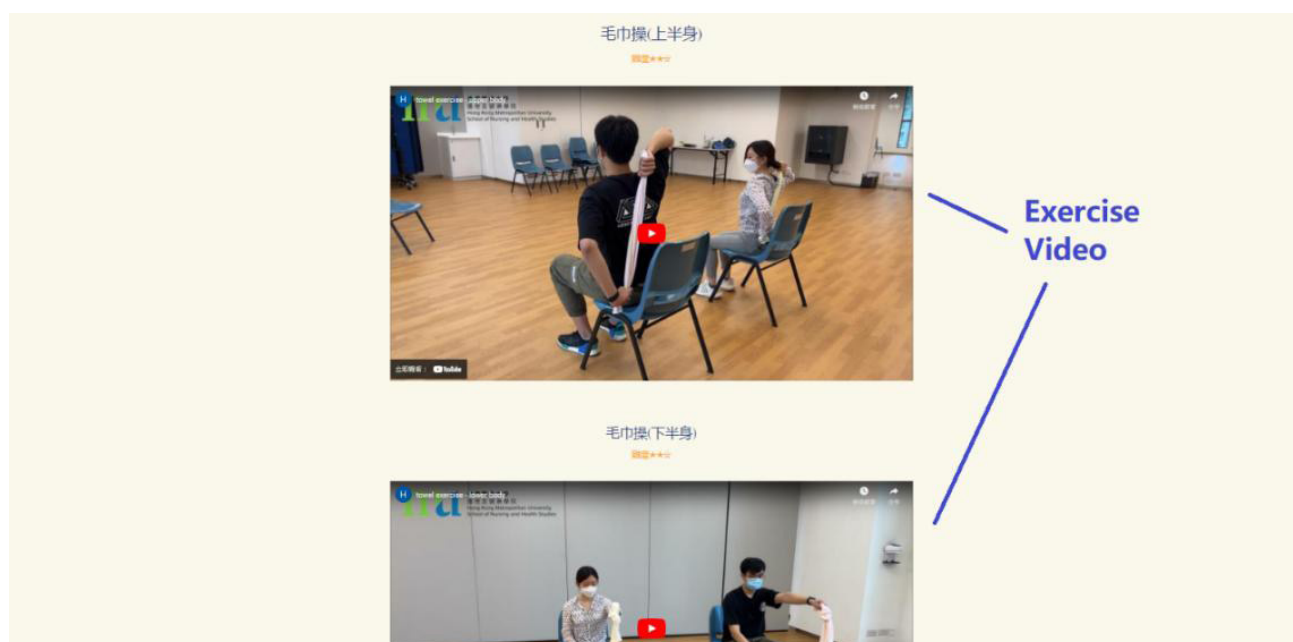
We invited all interviewees to read all the learning materials on their own, and had an interview after it. The interviewees would be asked three open-ended questions

**Table 1. Schedule of “Pain Management Program”**

Lesson	Section 1 (Concept Learning) Duration: 15-20min	Section 2 (Physical Exercise) Duration: 25-30min
1	Introducing the idea of “Total Pain”: definition of pain, effects of pain and measurement of pain	Towel exercise (upper body) and musical movement
2	Introducing pharmacological and non-pharmacological treatments and deep breathing exercise	Towel exercise (lower body) and musical movement (lower body, starter and advanced levels)
3	Introducing different kinds of non-pharmacological treatments: musical therapy, visual therapy and aromatherapy	Towel exercise (lower, upper and whole body) and musical movement (whole body)
4	Introducing the non-pharmacological treatments: stretching exercises and hot or cold compressing	Towel exercise (upper, lower and whole body) and musical movement (whole body)



**Figure 1. The home page of PMP online learning platform.**



**Figure 2. Exercise video page of PMP online learning platform.**





Figure 3. Chapter 1 - Learning material of PMP online learning platform.

as below:

1. Is it easy to access and understand the information on the PMP online platform?
2. Does it help you to know more about pain and pain management?
3. What do you think of the web-based learning mode of this program?

The first question aims to evaluate the content of the online platform to examine the accessibility of content. The second question focuses on “practice”, which aims to examine the feasibility of practice. Even if the older adults can understand all of the contents, they should show that they could deliver the ability of “self-caring” by following the instructions and recommendations provided by the materials. The last question aims to examine the mode of web-based learning, what are the characteristics of it to the participants? This is also to identify the significance of the program to them. On the other hand, we can understand their interests through their feedback and which is able to help us to consider the development strategy of the online platform.

As a result, we concluded the feedback from the participants as the followings:

#### (1) Accessibility of content

The answers included: “the content is straightforward, easy to digest”; “the contents are interrelated, it is easy to understand with the visual support of pictures”; and “I like to know the health information on the internet and it provides to me, this one with pictures and videos is more attractive”.

#### (2) Feasibility of practice

The answers included: “I will try those exercises at

home, it is good for me to spend leisure time”; “I believe that the information can help me to know more about my pain and also gives me guidelines for managing my pain”; “I am not good at using the internet, but this website is not hard to use”.

#### Satisfaction of web-based learning

The answers included: “the web-based learning platform is convenient, I can receive the information anytime and anywhere”; “I will share this platform to my friends and family, because it is convenient”; “It feels good, like I reconnect to the age of technology”; and “I am so glad to see a web-based learning platform which is create for older adults like me”.

We can see that the accessibility of content and feasibility of practice receive mostly the positive feedback. The content reported to be straightforward and user friendly in general due to the visual support of pictures and videos. This also showed older adults’ interests in learning.

For the comments on “web-based learning”, the feedback showed that older adults are interested in the web-based learning platform. The most common view was “convenient” which was related to the specific and unique feature of the internet. On the other hand, older adults also reported that the web-based learning platform can provide a chance for them to reconnect to modern society.

## 4 DISCUSSION

We have talked about the details of development and evaluation, now we shall discuss further about the online learning method for older adults, especially to the

**Table 2. Participant Characteristic**

Characteristic	n	%
Age, mean (range)	69.9 (60-81)	
Gender		
Female	4	40
Male	6	60
Marital status		
Single	0	0
Married / Partnered	7	70
Divorced	1	10
Widowed	2	20
Highest education		
No formal education	0	0
Primary school	6	50
Middle school	3	30
College degree or above	1	10
Employment		
Retired	10	100
Occupation before retirement		
Housekeeper	1	10
Businessman	1	10
Salesperson	2	20
Clerk	3	30
Construction workers	3	30
Monthly income (HKD\$)		
<10,000	10	100
How long you were in pain?		
More than 5 years	3	30
More than 8 years	4	40
More than 10 years	3	30
Which part hurts the most?		
Legs	1	10
Arms	2	20
Lower back	4	40
Neck	2	20
Wrist	1	10

older adults with chronic pain. In other words, this is a discussion on lifelong learning of older adults via the internet (or technology). The PMP web-based learning platform as a lifelong learning for older adults, we shall consider what the relationship between online lifelong learning and well-being is in later life.

#### 4.1 Web-based Learning as Lifelong Learning

Lifelong learning in later life is always a popular topic in modern society, especially for society struggling with “aging population” like Hong Kong. Lifelong learning is beneficial to the aging society since it is able to handle mental decline or brain function in older age<sup>[11]</sup>. The fact

**Table 3. Pain Situation**

Pain Intensity <sup>1</sup>	3.5±2.22
Pain self-efficacy <sup>2</sup>	4.54±1.44

Notes: <sup>1</sup>The Chinese version of the Brief Pain Inventory been used to assess the multidimensional nature of pain, including intensity and interference with life activities in the previous 24h; <sup>2</sup>The Chinese version of the Pain Self-efficacy Questionnaire (PSEQ) been used to measure self-efficacy in coping with activities despite pain.

that older adults are facing increasing frailty in their later life which brings a brunch of negative affections in biological, clinical and social aspects<sup>[12]</sup>. These three aspects are interrelated, starting from the personal point of view and extending to a macro view of society. In other words, lifelong learning in later life is not only related to older adults’ subjective idea of “well-being” or “quality of life”, but also to the agenda of social policy<sup>[11]</sup>.

In general, older adult learning means that “individuality and in association with others, engage in direct encounter and then purposefully reflect upon, validate, transform, give personal meaning to and seek to integrate their ways of knowing”<sup>[13]</sup>. It is not hard to see that lifelong learning in later life contains the idea of positive, active and healthy aging. As WHO’s definition on healthy aging “the process of developing and maintaining the functional ability that enables wellbeing in older age”<sup>[14]</sup>. In short, the main objective of lifelong learning is to help to achieve well-being in later life, ideally, it implies the power of empowerment and emancipation<sup>[15]</sup>. For empowerment, it means to let the older adults gain more freedom and autonomy, such as to gain the capacity of self-caring then to have more independence, thus to improve one’s quality of life. For emancipation, it is based on the idea of empowerment but also involves continuous reflection<sup>[15]</sup>.

Those ideas are aimed at improving older adults’ quality of life and well-being in later life, especially aiming at the notion of independence. For older adults’ independence, the mode of online learning could possibly become an effective way for them to improve their capacity of self-learning. As the previous research found that older adults are interested to learn things related to technology, health, safety and so on<sup>[16]</sup>. PMP web-based learning platform provides the services covering these areas, as a combination of health education, technological learning and daily life safety guide. Therefore, it is hopeful to see that the PMP web-based learning platform is able to fulfill the conditions and become one of the examples of online lifelong learning for older adults in Hong Kong.

As mentioned above, the phenomenon of the aging

population in Hong Kong has spread to every corner of society. As the three aspects mentioned, the notion of quality of life of older adults is not only as simple as older adults' personal point of view but also to the agenda of society. An unarguable fact is that the use of the internet has already become a trend of teaching and learning. During the pandemics like the COVID-19 pandemic, for the concerns of public hygiene, people are encouraged to avoid physical and social contact. On the one hand, it has promoted the use of virtual platforms such as the internet to interact with society<sup>[17]</sup>, it was an exclusion of people who are not familiar with internet use such as older adults on the other hand.

As we conclude older adults' evaluation and interests from the interview, it is important to promote online pain education to older adults. Thus, increased awareness of pain education for older adults in Hong Kong remains necessary. We can think of collaborating with local senior centers and healthcare providers. Senior centers are an important hub for older adults in Hong Kong, providing a range of services and activities. By partnering with these centers and healthcare providers, it is possible to reach a large number of older adults and provide them with online pain education resources. This can include working with senior center staff to develop educational materials, as well as providing training to staff on how to use and promote online pain education resources.

The PMP web-based learning platform creates a chance for the older adults to reconnect to the trend of modern society and a new mode of learning such as e-Learning<sup>[18]</sup>. For a long-term looking, the use of the internet having the potential to gather the community-dwelling older adults, made them formulate a community and enhanced their interaction with each other and the society as well. This is also to improve their quality of life in mental and physical aspects.

## 5 CONCLUSION

In conclusion, the PMP web-based learning platform could be considered as an alternative but remarkable pain education platform to older adults in Hong Kong. In considering the low digital literacy of older adults, we believe that "convenient" and "user-friendly" must be considered in the development. At the same time, the evaluation of content, practice and satisfaction of the web-based learning platform shows positive results, which means it is potentially effective for older adults with chronic pain. Along with the development and evaluation, the discussion part would be an elaboration of older adults learning.

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## Conflicts of Interest

The authors declared no conflict of interest.

## Author Contribution

Tse MMY and Liu TW conceived the ideas and design of the study; Leung SH, Liu TW and Tang SK performed data collection; Leung SH and Liu TW performed data analysis and interpretation; Tse MMY and Tang SK provided revisions of the manuscript; Liu TW and Leung SH were responsible for writing and editing; Tse MMY was responsible for supervision. All authors contributed to the manuscript and approved the final version.

## Ethical Approval Statement

According to Hong Kong Metropolitan University's guidelines and procedures for ethical review regarding human research, this ethical clearance application for the project has been approved by the Research Ethics Committee (REC).

## Abbreviation List

PMP, Pain Management Program

## References

- [1] Institute of Medicine Committee on Advancing Pain Research, Care, and Education. Relieving pain in America: A blueprint for transforming prevention, care, education, and research. National Academies Press: Washington D.C., USA, 2011. DOI: [10.17226/13172](https://doi.org/10.17226/13172)
- [2] Tse MMY, Ho SSK. Pain management for older persons living in nursing homes: A pilot study. *Pain Manag Nurs*, 2013; 14: 10-21. DOI: [10.1016/j.pmn.2011.01.004](https://doi.org/10.1016/j.pmn.2011.01.004)
- [3] Moyle S. The emotional and psychological impacts of chronic pain. Accessed 2018. Available at: <https://www.ausmed.com/cpd/articles/chronic-pain-emotional-psychological-impacts>
- [4] Kisner C, Colby LA, Borstad J. Therapeutic exercise : Foundations and techniques, 7th ed. Philadelphia: F.A. Davis Company, 2018.
- [5] Morrison D, McCutcheon J. Empowering older adults' informal, self-directed learning: Harnessing the potential of online personal learning networks. *Res Pract Technol Enhanc*, 2019; 14: 10. DOI: [10.1186/s41039-019-0104-5](https://doi.org/10.1186/s41039-019-0104-5)
- [6] Fong BYF, Yee HHL, Tommy KC et al. The use of technology for online learning among older adults in Hong Kong. *Int Rev Educ*, 2022; 68: 389. DOI: [10.1007/s11159-022-09957-7](https://doi.org/10.1007/s11159-022-09957-7)
- [7] Yu RP, McCammon RJ, Ellison NB et al. The relationships that matter: Social network site use and social wellbeing among older adults in the United States of America. *Ageing Soc*, 2016; 36: 1826-1852. DOI: [10.1017/S0144686X15000677](https://doi.org/10.1017/S0144686X15000677)
- [8] Chang A, Schulz PJ, Diccio M. Social media use and health

- literacy among older adults. *J Cons Hlth Internet*, 2015; 19: 173-184.
- [9] Ancker JS, Senathirajah Y, Kukafka R et al. Design features of graphs in health risk communication: A systematic review. *J Am Med Inform Assoc*, 2013; 20: 311-318. DOI: [10.1197%2Fjamia.M2115](https://doi.org/10.1197%2Fjamia.M2115)
- [10] Sze PC, Lam HW, Au-Yeung KY et al. An interactive functional assessment for promoting healthy ageing in a primary healthcare setting in Hong Kong. *Gerontechnology*, 2014; 13: 285. DOI: [10.4017/gt.2014.13.02.290.00](https://doi.org/10.4017/gt.2014.13.02.290.00)
- [11] Tam M. Active ageing, active learning: Policy and provision in Hong Kong. *Stud Contin Educ*, 2011; 33: 289-299. DOI: [10.1080/0158037X.2010.515573](https://doi.org/10.1080/0158037X.2010.515573)
- [12] Rockwood K, Theou O. Frailty in aging: Biological, clinical and social implications. *Interdiscip Top Gerontol Geriatr*, 2015; 41: VII-X. DOI: [10.1159/isbn.978-3-318-05457-6](https://doi.org/10.1159/isbn.978-3-318-05457-6)
- [13] Formosa M. Lifelong Learning in Later Life. In: Research on the Education and Learning of Adults. Sense Publishers: Rotterdam, Netherlands, 2014. DOI: [10.1007/978-94-6209-902-9\\_2](https://doi.org/10.1007/978-94-6209-902-9_2)
- [14] World Health Organization. Healthy ageing and functional ability. Accessed 26 October 2020. Available at: <https://www.who.int/news-room/questions-and-answers/item/healthy-ageing-and-functional-ability>
- [15] Olesen HS, Wildemeersch D. Editorial: The effects of policies for the education and learning of adults - from 'adult education' to 'lifelong learning', from 'emancipation' to 'empowerment'. *Eur J Res Educ Learn*, 2012; 3: 97-101. DOI: [10.3384/rela.2000-7426.relae5](https://doi.org/10.3384/rela.2000-7426.relae5)
- [16] Purdie N, Boulton-Lewis G. The learning needs of older adults. *Educ Gerontol*, 2003; 29: 129-149. DOI: [10.1080/713844281](https://doi.org/10.1080/713844281)
- [17] McGaffin S, Taggart M, Smyth D et al. Transitioning a cardiovascular health and rehabilitation programme to a virtual platform during COVID-19. *Eur J Cardiovasc Nur*, 2021; 20: i78. DOI: [10.1093/eurjcn/zvab060.073](https://doi.org/10.1093/eurjcn/zvab060.073)
- [18] DAmico D, Yusupov I, Zhu L et al. Feasibility, acceptability, and impact of a self-guided e-learning memory and brain health promotion program for healthy older adults. *Clin Gerontologist*, 2022 [Ahead-of-print]. DOI: [10.1080/07317115.2022.2088325](https://doi.org/10.1080/07317115.2022.2088325)